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85 90 95  
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100 105 110  
Glu Thr Pro Ile Ala Tyr Arg Asn Val Leu Leu Arg Lys Asn Gly Asn  
115 120 125  
Lys Gly Ala Gly Gly His Ser Tyr Gly Ile Asp Leu Lys Ser Tyr Asp  
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Thr Gly Ile Thr Gly Asp Asn Val Glu Thr Leu Asn Glu Asp Leu Leu  
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Glu Ile Leu Ser Arg Glu Arg Val Asn Ile Asn Ile Val Gly Asp Phe  
275 280 285

His Leu Asn Glu Glu Val Ala Ile Ile Leu Ala Ser Phe Ser Ala Ser  
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Thr Ser Ala Phe Ile Asp Thr Ile Lys Ser Leu Asp Tyr Lys Ser Phe  
305 310 315 320

Lys Thr Ile Val Glu Ser Cys Gly Asn Tyr Lys Val Thr Lys Gly Lys  
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Pro Val Lys Gly Ala Trp Asn Ile Gly Gln Gln Arg Ser Val Leu Thr  
340 345 350

Pro Leu Cys Gly Phe Pro Ser Gln Ala Ala Gly Val Ile Arg Ser Ile  
355 360 365

Phe Ala Arg Thr Leu Asp Ala Ala Asn His Ser Ile Pro Asp Leu Gln  
370 375 380

Arg Ala Ala Val Thr Ile Leu Asp Gly Ile Ser Glu Gln Ser Leu Arg  
385 390 395 400

Leu Val Asp Ala Met Val Tyr Thr Ser Asp Leu Leu Thr Asn Ser Val  
405 410 415

Ile Ile Met Ala Tyr Val Thr Gly Gly Leu Val Gln Gln Thr Ser Gln  
420 425 430

Trp Leu Ser Asn Leu Leu Gly Thr Thr Val Glu Lys Leu Arg Pro Ile  
435 440 445

Phe Glu Trp Ile Glu Ala Lys Leu Ser Ala Gly Val Glu Phe Leu Lys  
450 455 460

Asp Ala Trp Glu Ile Leu Lys Phe Leu Ile Thr Gly Val Phe Asp Ile  
465 470 475 480

Val Lys Gly Gln Ile Gln Val Ala Ser Asp Asn Ile Lys Asp Cys Val  
485 490 495

SEQLIST-20480.TXT

Lys Cys Phe Ile Asp Val Val Asn Lys Ala Leu Glu Met Cys Ile Asp  
500 505 510

Gln Val Thr Ile Ala Gly Ala Lys Leu Arg Ser Leu Asn Leu Gly Glu  
515 520 525

Val Phe Ile Ala Gln Ser Lys Gly Leu Tyr Arg Gln Cys Ile Arg Gly  
530 535 540

Lys Glu Gln Leu Gln Leu Leu Met Pro Leu Lys Ala Pro Lys Glu Val  
545 550 555 560

Thr Phe Leu Glu Gly Asp Ser His Asp Thr Val Leu Thr Ser Glu Glu  
565 570 575

Val Val Leu Lys Asn Gly Glu Leu Glu Ala Leu Glu Thr Pro Val Asp  
580 585 590

Ser Phe Thr Asn Gly Ala Ile Val Gly Thr Pro Val Cys Val Asn Gly  
595 600 605

Leu Met Leu Leu Glu Ile Lys Asp Lys Glu Gln Tyr Cys Ala Leu Ser  
610 615 620

Pro Gly Leu Leu Ala Thr Asn Asn Val Phe Arg Leu Lys Gly Gly  
625 630 635

<210> 9768  
<211> 2422  
<212> PRT  
<213> SARS coronavirus

<400> 9768  
Ala Pro Ile Lys Gly Val Thr Phe Gly Glu Asp Thr Val Trp Glu Val  
1 5 10 15

Gln Gly Tyr Lys Asn Val Arg Ile Thr Phe Glu Leu Asp Glu Arg Val  
20 25 30

Asp Lys Val Leu Asn Glu Lys Cys Ser Val Tyr Thr Val Glu Ser Gly  
35 40 45

Thr Glu Val Thr Glu Phe Ala Cys Val Val Ala Glu Ala Val Val Lys  
50 55 60

Thr Leu Gln Pro Val Ser Asp Leu Leu Thr Asn Met Gly Ile Asp Leu  
65 70 75 80

Asp Glu Trp Ser Val Ala Thr Phe Tyr Leu Phe Asp Asp Ala Gly Glu  
85 90 95

Glu Asn Phe Ser Ser Arg Met Tyr Cys Ser Phe Tyr Pro Pro Asp Glu  
100 105 110

Glu Glu Glu Asp Asp Ala Glu Cys Glu Glu Glu Glu Ile Asp Glu Thr  
115 120 125

Cys Glu His Glu Tyr Gly Thr Glu Asp Asp Tyr Gln Gly Leu Pro Leu  
130 135 140

Glu Phe Gly Ala Ser Ala Glu Thr Val Arg Val Glu Glu Glu Glu Glu  
145 150 155 160

SEQLIST-20480.TXT

Glu Asp Trp Leu Asp 165 Asp Thr Thr Glu Gln 170 Ser Glu Ile Glu Pro Glu 175  
 Pro Glu Pro Thr 180 Pro Glu Glu Pro Val 185 Asn Gln Phe Thr Gly 190 Tyr Leu  
 Lys Leu Thr 195 Asp Asn Val Ala Ile 200 Lys Cys Val Asp Ile 205 Val Lys Glu  
 Ala Gln 210 Ser Ala Asn Pro Met 215 Val Ile Val Asn Ala 220 Ala Asn Ile His  
 Leu 225 Lys His Gly Gly 230 Val Ala Gly Ala Leu 235 Asn Lys Ala Thr Asn 240  
 Gly Ala Met Gln 245 Lys Glu Ser Asp Asp Tyr 250 Ile Lys Leu Asn Gly 255 Pro  
 Leu Thr Val Gly 260 Gly Ser Cys Leu Leu 265 Ser Gly His Asn Leu 270 Ala Lys  
 Lys Cys Leu 275 His Val Val Gly Pro 280 Asn Leu Asn Ala Gly 285 Glu Asp Ile  
 Gln Leu 290 Leu Lys Ala Ala Tyr 295 Glu Asn Phe Asn Ser 300 Gln Asp Ile Leu  
 Leu 305 Ala Pro Leu Leu Ser 310 Ala Gly Ile Phe Gly 315 Ala Lys Pro Leu Gln 320  
 Ser Leu Gln Val Cys 325 Val Gln Thr Val Arg 330 Thr Gln Val Tyr Ile 335 Ala  
 Val Asn Asp Lys 340 Ala Leu Tyr Glu Gln 345 Val Val Met Asp Tyr 350 Leu Asp  
 Asn Leu Lys 355 Pro Arg Val Glu Ala 360 Pro Lys Gln Glu Glu 365 Pro Pro Asn  
 Thr Glu 370 Asp Ser Lys Thr Glu 375 Glu Lys Ser Val Val 380 Gln Lys Pro Val  
 Asp 385 Val Lys Pro Lys Ile 390 Lys Ala Cys Ile Asp 395 Glu Val Thr Thr Thr 400  
 Leu Glu Glu Thr Lys 405 Phe Leu Thr Asn Lys 410 Leu Leu Leu Phe Ala 415 Asp  
 Ile Asn Gly Lys 420 Leu Tyr His Asp Ser 425 Gln Asn Met Leu Arg 430 Gly Glu  
 Asp Met Ser 435 Phe Leu Glu Lys Asp 440 Ala Pro Tyr Met Val 445 Gly Asp Val  
 Ile Thr 450 Ser Gly Asp Ile Thr 455 Cys Val Val Ile Pro 460 Ser Lys Lys Ala  
 Gly 465 Gly Thr Thr Glu Met 470 Leu Ser Arg Ala Leu 475 Lys Lys Val Pro Val 480  
 Asp Glu Tyr Ile Thr 485 Thr Tyr Pro Gly Gln 490 Gly Cys Ala Gly Tyr 495 Thr

SEQLIST-20480.TXT

Leu Glu Glu Ala Lys Thr Ala Leu Lys Lys Cys Lys Ser Ala Phe Tyr  
 500 505 510  
 Val Leu Pro Ser Glu Ala Pro Asn Ala Lys Glu Glu Ile Leu Gly Thr  
 515 520 525  
 Val Ser Trp Asn Leu Arg Glu Met Leu Ala His Ala Glu Glu Thr Arg  
 530 535 540  
 Lys Leu Met Pro Ile Cys Met Asp Val Arg Ala Ile Met Ala Thr Ile  
 545 550 555 560  
 Gln Arg Lys Tyr Lys Gly Ile Lys Ile Gln Glu Gly Ile Val Asp Tyr  
 565 570 575  
 Gly Val Arg Phe Phe Phe Tyr Thr Ser Lys Glu Pro Val Ala Ser Ile  
 580 585 590  
 Ile Thr Lys Leu Asn Ser Leu Asn Glu Pro Leu Val Thr Met Pro Ile  
 595 600 605  
 Gly Tyr Val Thr His Gly Phe Asn Leu Glu Glu Ala Ala Arg Cys Met  
 610 615 620  
 Arg Ser Leu Lys Ala Pro Ala Val Val Ser Val Ser Ser Pro Asp Ala  
 625 630 635 640  
 Val Thr Thr Tyr Asn Gly Tyr Leu Thr Ser Ser Ser Lys Thr Ser Glu  
 645 650 655  
 Glu His Phe Val Glu Thr Val Ser Leu Ala Gly Ser Tyr Arg Asp Trp  
 660 665 670  
 Ser Tyr Ser Gly Gln Arg Thr Glu Leu Gly Val Glu Phe Leu Lys Arg  
 675 680 685  
 Gly Asp Lys Ile Val Tyr His Thr Leu Glu Ser Pro Val Glu Phe His  
 690 695 700  
 Leu Asp Gly Glu Val Leu Ser Leu Asp Lys Leu Lys Ser Leu Leu Ser  
 705 710 715 720  
 Leu Arg Glu Val Lys Thr Ile Lys Val Phe Thr Thr Val Asp Asn Thr  
 725 730 735  
 Asn Leu His Thr Gln Leu Val Asp Met Ser Met Thr Tyr Gly Gln Gln  
 740 745 750  
 Phe Gly Pro Thr Tyr Leu Asp Gly Ala Asp Val Thr Lys Ile Lys Pro  
 755 760 765  
 His Val Asn His Glu Gly Lys Thr Phe Phe Val Leu Pro Ser Asp Asp  
 770 775 780  
 Thr Leu Arg Ser Glu Ala Phe Glu Tyr Tyr His Thr Leu Asp Glu Ser  
 785 790 795 800  
 Phe Leu Gly Arg Tyr Met Ser Ala Leu Asn His Thr Lys Lys Trp Lys  
 805 810 815  
 Phe Pro Gln Val Gly Gly Leu Thr Ser Ile Lys Trp Ala Asp Asn Asn  
 820 825 830

SEQLIST-20480.TXT

Cys Tyr Leu Ser Ser Val Leu Leu Ala Leu Gln Gln Leu Glu Val Lys  
835 840 845

Phe Asn Ala Pro Ala Leu Gln Glu Ala Tyr Tyr Arg Ala Arg Ala Gly  
850 855 860

Asp Ala Ala Asn Phe Cys Ala Leu Ile Leu Ala Tyr Ser Asn Lys Thr  
865 870 875 880

Val Gly Glu Leu Gly Asp Val Arg Glu Thr Met Thr His Leu Leu Gln  
885 890 895

His Ala Asn Leu Glu Ser Ala Lys Arg Val Leu Asn Val Val Cys Lys  
900 905 910

His Cys Gly Gln Lys Thr Thr Thr Leu Thr Gly Val Glu Ala Val Met  
915 920 925

Tyr Met Gly Thr Leu Ser Tyr Asp Asn Leu Lys Thr Gly Val Ser Ile  
930 935 940

Pro Cys Val Cys Gly Arg Asp Ala Thr Gln Tyr Leu Val Gln Gln Glu  
945 950 955 960

Ser Ser Phe Val Met Met Ser Ala Pro Pro Ala Glu Tyr Lys Leu Gln  
965 970 975

Gln Gly Thr Phe Leu Cys Ala Asn Glu Tyr Thr Gly Asn Tyr Gln Cys  
980 985 990

Gly His Tyr Thr His Ile Thr Ala Lys Glu Thr Leu Tyr Arg Ile Asp  
995 1000 1005

Gly Ala His Leu Thr Lys Met Ser Glu Tyr Lys Gly Pro Val Thr Asp  
1010 1015 1020

Val Phe Tyr Lys Glu Thr Ser Tyr Thr Thr Thr Ile Lys Pro Val Ser  
1025 1030 1035 1040

Tyr Lys Leu Asp Gly Val Thr Tyr Thr Glu Ile Glu Pro Lys Leu Asp  
1045 1050 1055

Gly Tyr Tyr Lys Lys Asp Asn Ala Tyr Tyr Thr Glu Gln Pro Ile Asp  
1060 1065 1070

Leu Val Pro Thr Gln Pro Leu Pro Asn Ala Ser Phe Asp Asn Phe Lys  
1075 1080 1085

Leu Thr Cys Ser Asn Thr Lys Phe Ala Asp Asp Leu Asn Gln Met Thr  
1090 1095 1100

Gly Phe Thr Lys Pro Ala Ser Arg Glu Leu Ser Val Thr Phe Phe Pro  
1105 1110 1115 1120

Asp Leu Asn Gly Asp Val Val Ala Ile Asp Tyr Arg His Tyr Ser Ala  
1125 1130 1135

Ser Phe Lys Lys Gly Ala Lys Leu Leu His Lys Pro Ile Val Trp His  
1140 1145 1150

Ile Asn Gln Ala Thr Thr Lys Thr Thr Phe Lys Pro Asn Thr Trp Cys  
1155 1160 1165

SEQLIST-20480.TXT

Leu Arg Cys Leu Trp Ser Thr Lys Pro Val Asp Thr Ser Asn Ser Phe  
 1170 1175 1180  
 Glu Val Leu Ala Val Glu Asp Thr Gln Gly Met Asp Asn Leu Ala Cys  
 1185 1190 1195 1200  
 Glu Ser Gln Gln Pro Thr Ser Glu Glu Val Val Glu Asn Pro Thr Ile  
 1205 1210 1215  
 Gln Lys Glu Val Ile Glu Cys Asp Val Lys Thr Thr Glu Val Val Gly  
 1220 1225 1230  
 Asn Val Ile Leu Lys Pro Ser Asp Glu Gly Val Lys Val Thr Gln Glu  
 1235 1240 1245  
 Leu Gly His Glu Asp Leu Met Ala Ala Tyr Val Glu Asn Thr Ser Ile  
 1250 1255 1260  
 Thr Ile Lys Lys Pro Asn Glu Leu Ser Leu Ala Leu Gly Leu Lys Thr  
 1265 1270 1275 1280  
 Ile Ala Thr His Gly Ile Ala Ala Ile Asn Ser Val Pro Trp Ser Lys  
 1285 1290 1295  
 Ile Leu Ala Tyr Val Lys Pro Phe Leu Gly Gln Ala Ala Ile Thr Thr  
 1300 1305 1310  
 Ser Asn Cys Ala Lys Arg Leu Ala Gln Arg Val Phe Asn Asn Tyr Met  
 1315 1320 1325  
 Pro Tyr Val Phe Thr Leu Leu Phe Gln Leu Cys Thr Phe Thr Lys Ser  
 1330 1335 1340  
 Thr Asn Ser Arg Ile Arg Ala Ser Leu Pro Thr Thr Ile Ala Lys Asn  
 1345 1350 1355 1360  
 Ser Val Lys Ser Val Ala Lys Leu Cys Leu Asp Ala Gly Ile Asn Tyr  
 1365 1370 1375  
 Val Lys Ser Pro Lys Phe Ser Lys Leu Phe Thr Ile Ala Met Trp Leu  
 1380 1385 1390  
 Leu Leu Leu Ser Ile Cys Leu Gly Ser Leu Ile Cys Val Thr Ala Ala  
 1395 1400 1405  
 Phe Gly Val Leu Leu Ser Asn Phe Gly Ala Pro Ser Tyr Cys Asn Gly  
 1410 1415 1420  
 Val Arg Glu Leu Tyr Leu Asn Ser Ser Asn Val Thr Thr Met Asp Phe  
 1425 1430 1435 1440  
 Cys Glu Gly Ser Phe Pro Cys Ser Ile Cys Leu Ser Gly Leu Asp Ser  
 1445 1450 1455  
 Leu Asp Ser Tyr Pro Ala Leu Glu Thr Ile Gln Val Thr Ile Ser Ser  
 1460 1465 1470  
 Tyr Lys Leu Asp Leu Thr Ile Leu Gly Leu Ala Ala Glu Trp Val Leu  
 1475 1480 1485  
 Ala Tyr Met Leu Phe Thr Lys Phe Phe Tyr Leu Leu Gly Leu Ser Ala  
 1490 1495 1500



SEQLIST-20480.TXT

Ile Met Gln Val Phe Phe Gly Tyr Phe Ala Ser His Phe Ile Ser Asn  
1505 1510 1515 1520

Ser Trp Leu Met Trp Phe Ile Ile Ser Ile Val Gln Met Ala Pro Val  
1525 1530 1535

Ser Ala Met Val Arg Met Tyr Ile Phe Phe Ala Ser Phe Tyr Tyr Ile  
1540 1545 1550

Trp Lys Ser Tyr Val His Ile Met Asp Gly Cys Thr Ser Ser Thr Cys  
1555 1560 1565

Met Met Cys Tyr Lys Arg Asn Arg Ala Thr Arg Val Glu Cys Thr Thr  
1570 1575 1580

Ile Val Asn Gly Met Lys Arg Ser Phe Tyr Val Tyr Ala Asn Gly Gly  
1585 1590 1595 1600

Arg Gly Phe Cys Lys Thr His Asn Trp Asn Cys Leu Asn Cys Asp Thr  
1605 1610 1615

Phe Cys Thr Gly Ser Thr Phe Ile Ser Asp Glu Val Ala Arg Asp Leu  
1620 1625 1630

Ser Leu Gln Phe Lys Arg Pro Ile Asn Pro Thr Asp Gln Ser Ser Tyr  
1635 1640 1645

Ile Val Asp Ser Val Ala Val Lys Asn Gly Ala Leu His Leu Tyr Phe  
1650 1655 1660

Asp Lys Ala Gly Gln Lys Thr Tyr Glu Arg His Pro Leu Ser His Phe  
1665 1670 1675 1680

Val Asn Leu Asp Asn Leu Arg Ala Asn Asn Thr Lys Gly Ser Leu Pro  
1685 1690 1695

Ile Asn Val Ile Val Phe Asp Gly Lys Ser Lys Cys Asp Glu Ser Ala  
1700 1705 1710

Ser Lys Ser Ala Ser Val Tyr Tyr Ser Gln Leu Met Cys Gln Pro Ile  
1715 1720 1725

Leu Leu Leu Asp Gln Ala Leu Val Ser Asp Val Gly Asp Ser Thr Glu  
1730 1735 1740

Val Ser Val Lys Met Phe Asp Ala Tyr Val Asp Thr Phe Ser Ala Thr  
1745 1750 1755 1760

Phe Ser Val Pro Met Glu Lys Leu Lys Ala Leu Val Ala Thr Ala His  
1765 1770 1775

Ser Glu Leu Ala Lys Gly Val Ala Leu Asp Gly Val Leu Ser Thr Phe  
1780 1785 1790

Val Ser Ala Ala Arg Gln Gly Val Val Asp Thr Asp Val Asp Thr Lys  
1795 1800 1805

Asp Val Ile Glu Cys Leu Lys Leu Ser His His Ser Asp Leu Glu Val  
1810 1815 1820

Thr Gly Asp Ser Cys Asn Asn Phe Met Leu Thr Tyr Asn Lys Val Glu  
1825 1830 1835 1840

SEQLIST-20480.TXT

Asn Met Thr Pro Arg Asp Leu Gly Ala Cys Ile Asp Cys Asn Ala Arg  
1845 1850 1855

His Ile Asn Ala Gln Val Ala Lys Ser His Asn Val Ser Leu Ile Trp  
1860 1865 1870

Asn Val Lys Asp Tyr Met Ser Leu Ser Glu Gln Leu Arg Lys Gln Ile  
1875 1880 1885

Arg Ser Ala Ala Lys Lys Asn Asn Ile Pro Phe Arg Leu Thr Cys Ala  
1890 1895 1900

Thr Thr Arg Gln Val Val Asn Val Ile Thr Thr Lys Ile Ser Leu Lys  
1905 1910 1915 1920

Gly Gly Lys Ile Val Ser Thr Cys Phe Lys Leu Met Leu Lys Ala Thr  
1925 1930 1935

Leu Leu Cys Val Leu Ala Ala Leu Val Cys Tyr Ile Val Met Pro Val  
1940 1945 1950

His Thr Leu Ser Ile His Asp Gly Tyr Thr Asn Glu Ile Ile Gly Tyr  
1955 1960 1965

Lys Ala Ile Gln Asp Gly Val Thr Arg Asp Ile Ile Ser Thr Asp Asp  
1970 1975 1980

Cys Phe Ala Asn Lys His Ala Gly Phe Asp Ala Trp Phe Ser Gln Arg  
1985 1990 1995 2000

Gly Gly Ser Tyr Lys Asn Asp Lys Ser Cys Pro Val Val Ala Ala Ile  
2005 2010 2015

Ile Thr Arg Glu Ile Gly Phe Ile Val Pro Gly Leu Pro Gly Thr Val  
2020 2025 2030

Leu Arg Ala Ile Asn Gly Asp Phe Leu His Phe Leu Pro Arg Val Phe  
2035 2040 2045

Ser Ala Val Gly Asn Ile Cys Tyr Thr Pro Ser Lys Leu Ile Glu Tyr  
2050 2055 2060

Ser Asp Phe Ala Thr Ser Ala Cys Val Leu Ala Ala Glu Cys Thr Ile  
2065 2070 2075 2080

Phe Lys Asp Ala Met Gly Lys Pro Val Pro Tyr Cys Tyr Asp Thr Asn  
2085 2090 2095

Leu Leu Glu Gly Ser Ile Ser Tyr Ser Glu Leu Arg Pro Asp Thr Arg  
2100 2105 2110

Tyr Val Leu Met Asp Gly Ser Ile Ile Gln Phe Pro Asn Thr Tyr Leu  
2115 2120 2125

Glu Gly Ser Val Arg Val Val Thr Thr Phe Asp Ala Glu Tyr Cys Arg  
2130 2135 2140

His Gly Thr Cys Glu Arg Ser Glu Val Gly Ile Cys Leu Ser Thr Ser  
2145 2150 2155 2160

Gly Arg Trp Val Leu Asn Asn Glu His Tyr Arg Ala Leu Ser Gly Val  
2165 2170 2175

SEQLIST-20480.TXT

Phe Cys Gly Val Asp Ala Met Asn Leu Ile Ala Asn Ile Phe Thr Pro  
2180 2185 2190

Leu Val Gln Pro Val Gly Ala Leu Asp Val Ser Ala Ser Val Val Ala  
2195 2200 2205

Gly Gly Ile Ile Ala Ile Leu Val Thr Cys Ala Ala Tyr Tyr Phe Met  
2210 2215 2220

Lys Phe Arg Arg Val Phe Gly Glu Tyr Asn His Val Val Ala Ala Asn  
2225 2230 2235 2240

Ala Leu Leu Phe Leu Met Ser Phe Thr Ile Leu Cys Leu Val Pro Ala  
2245 2250 2255

Tyr Ser Phe Leu Pro Gly Val Tyr Ser Val Phe Tyr Leu Tyr Leu Thr  
2260 2265 2270

Phe Tyr Phe Thr Asn Asp Val Ser Phe Leu Ala His Leu Gln Trp Phe  
2275 2280 2285

Ala Met Phe Ser Pro Ile Val Pro Phe Trp Ile Thr Ala Ile Tyr Val  
2290 2295 2300

Phe Cys Ile Ser Leu Lys His Cys His Trp Phe Phe Asn Asn Tyr Leu  
2305 2310 2315 2320

Arg Lys Arg Val Met Phe Asn Gly Val Thr Phe Ser Thr Phe Glu Glu  
2325 2330 2335

Ala Ala Leu Cys Thr Phe Leu Leu Asn Lys Glu Met Tyr Leu Lys Leu  
2340 2345 2350

Arg Ser Glu Thr Leu Leu Pro Leu Thr Gln Tyr Asn Arg Tyr Leu Ala  
2355 2360 2365

Leu Tyr Asn Lys Tyr Lys Tyr Phe Ser Gly Ala Leu Asp Thr Thr Ser  
2370 2375 2380

Tyr Arg Glu Ala Ala Cys Cys His Leu Ala Lys Ala Leu Asn Asp Phe  
2385 2390 2395 2400

Ser Asn Ser Gly Ala Asp Val Leu Tyr Gln Pro Pro Gln Thr Ser Ile  
2405 2410 2415

Thr Ser Ala Val Leu Gln  
2420

<210> 9769  
<211> 306  
<212> PRT  
<213> SARS coronavirus

<400> 9769  
Ser Gly Phe Arg Lys Met Ala Phe Pro Ser Gly Lys Val Glu Gly Cys  
1 5 10 15

Met Val Gln Val Thr Cys Gly Thr Thr Thr Leu Asn Gly Leu Trp Leu  
20 25 30

Asp Asp Thr Val Tyr Cys Pro Arg His Val Ile Cys Thr Ala Glu Asp  
35 40 45

SEQLIST-20480.TXT

Met Leu Asn Pro Asn Tyr Glu Asp Leu Leu Ile Arg Lys Ser Asn His  
50 55 60  
Ser Phe Leu Val Gln Ala Gly Asn Val Gln Leu Arg Val Ile Gly His  
65 70 75 80  
Ser Met Gln Asn Cys Leu Leu Arg Leu Lys Val Asp Thr Ser Asn Pro  
85 90 95  
Lys Thr Pro Lys Tyr Lys Phe Val Arg Ile Gln Pro Gly Gln Thr Phe  
100 105 110  
Ser Val Leu Ala Cys Tyr Asn Gly Ser Pro Ser Gly Val Tyr Gln Cys  
115 120 125  
Ala Met Arg Pro Asn His Thr Ile Lys Gly Ser Phe Leu Asn Gly Ser  
130 135 140  
Cys Gly Ser Val Gly Phe Asn Ile Asp Tyr Asp Cys Val Ser Phe Cys  
145 150 155 160  
Tyr Met His His Met Glu Leu Pro Thr Gly Val His Ala Gly Thr Asp  
165 170 175  
Leu Glu Gly Lys Phe Tyr Gly Pro Phe Val Asp Arg Gln Thr Ala Gln  
180 185 190  
Ala Ala Gly Thr Asp Thr Thr Ile Thr Leu Asn Val Leu Ala Trp Leu  
195 200 205  
Tyr Ala Ala Val Ile Asn Gly Asp Arg Trp Phe Leu Asn Arg Phe Thr  
210 215 220  
Thr Thr Leu Asn Asp Phe Asn Leu Val Ala Met Lys Tyr Asn Tyr Glu  
225 230 235 240  
Pro Leu Thr Gln Asp His Val Asp Ile Leu Gly Pro Leu Ser Ala Gln  
245 250 255  
Thr Gly Ile Ala Val Leu Asp Met Cys Ala Ala Leu Lys Glu Leu Leu  
260 265 270  
Gln Asn Gly Met Asn Gly Arg Thr Ile Leu Gly Ser Thr Ile Leu Glu  
275 280 285  
Asp Glu Phe Thr Pro Phe Asp Val Val Arg Gln Cys Ser Gly Val Thr  
290 295 300  
Phe Gln  
305

<210> 9770  
<211> 290  
<212> PRT  
<213> SARS coronavirus

<400> 9770  
Gly Lys Phe Lys Lys Ile Val Lys Gly Thr His His Trp Met Leu Leu  
1 5 10 15  
Thr Phe Leu Thr Ser Leu Leu Ile Leu Val Gln Ser Thr Gln Trp Ser  
20 25 30

SEQLIST-20480.TXT

Leu Phe Phe Phe Val Tyr Glu Asn Ala Phe Leu Pro Phe Thr Leu Gly  
35 40 45  
Ile Met Ala Ile Ala Ala Cys Ala Met Leu Leu Val Lys His Lys His  
50 55 60  
Ala Phe Leu Cys Leu Phe Leu Leu Pro Ser Leu Ala Thr Val Ala Tyr  
65 70 75 80  
Phe Asn Met Val Tyr Met Pro Ala Ser Trp Val Met Arg Ile Met Thr  
85 90 95  
Trp Leu Glu Leu Ala Asp Thr Ser Leu Ser Gly Tyr Arg Leu Lys Asp  
100 105 110  
Cys Val Met Tyr Ala Ser Ala Leu Val Leu Leu Ile Leu Met Thr Ala  
115 120 125  
Arg Thr Val Tyr Asp Asp Ala Ala Arg Arg Val Trp Thr Leu Met Asn  
130 135 140  
Val Ile Thr Leu Val Tyr Lys Val Tyr Tyr Gly Asn Ala Leu Asp Gln  
145 150 155 160  
Ala Ile Ser Met Trp Ala Leu Val Ile Ser Val Thr Ser Asn Tyr Ser  
165 170 175  
Gly Val Val Thr Thr Ile Met Phe Leu Ala Arg Ala Ile Val Phe Val  
180 185 190  
Cys Val Glu Tyr Tyr Pro Leu Leu Phe Ile Thr Gly Asn Thr Leu Gln  
195 200 205  
Cys Ile Met Leu Val Tyr Cys Phe Leu Gly Tyr Cys Cys Cys Tyr  
210 215 220  
Phe Gly Leu Phe Cys Leu Leu Asn Arg Tyr Phe Arg Leu Thr Leu Gly  
225 230 235 240  
Val Tyr Asp Tyr Leu Val Ser Thr Gln Glu Phe Arg Tyr Met Asn Ser  
245 250 255  
Gln Gly Leu Leu Pro Pro Lys Ser Ser Ile Asp Ala Phe Lys Leu Asn  
260 265 270  
Ile Lys Leu Leu Gly Ile Gly Gly Lys Pro Cys Ile Lys Val Ala Thr  
275 280 285  
Val Gln  
290

<210> 9771  
<211> 83  
<212> PRT  
<213> SARS coronavirus

<400> 9771  
Ser Lys Met Ser Asp Val Lys Cys Thr Ser Val Val Leu Leu Ser Val  
1 5 10 15  
Leu Gln Gln Leu Arg Val Glu Ser Ser Ser Lys Leu Trp Ala Gln Cys  
20 25 30

SEQLIST-20480.TXT

Val Gln Leu His Asn Asp Ile Leu Leu Ala Lys Asp Thr Thr Glu Ala  
35 40 45

Phe Glu Lys Met Val Ser Leu Leu Ser Val Leu Leu Ser Met Gln Gly  
50 55 60

Ala Val Asp Ile Asn Arg Leu Cys Glu Glu Met Leu Asp Asn Arg Ala  
65 70 75 80

Thr Leu Gln

<210> 9772  
<211> 198  
<212> PRT  
<213> SARS coronavirus

<400> 9772  
Ala Ile Ala Ser Glu Phe Ser Ser Leu Pro Ser Tyr Ala Ala Tyr Ala  
1 5 10 15

Thr Ala Gln Glu Ala Tyr Glu Gln Ala Val Ala Asn Gly Asp Ser Glu  
20 25 30

Val Val Leu Lys Lys Leu Lys Lys Ser Leu Asn Val Ala Lys Ser Glu  
35 40 45

Phe Asp Arg Asp Ala Ala Met Glu Arg Lys Leu Glu Lys Met Ala Asp  
50 55 60

Gln Ala Met Thr Gln Met Tyr Lys Gln Ala Arg Ser Glu Asp Lys Arg  
65 70 75 80

Ala Lys Val Thr Ser Ala Met Gln Thr Met Leu Phe Thr Met Leu Arg  
85 90 95

Lys Leu Asp Asn Asp Ala Leu Asn Asn Ile Ile Asn Asn Ala Arg Asp  
100 105 110

Gly Cys Val Pro Leu Asn Ile Ile Pro Leu Thr Thr Ala Ala Lys Leu  
115 120 125

Met Val Val Val Pro Asp Tyr Gly Thr Tyr Lys Asn Thr Cys Asp Gly  
130 135 140

Asn Thr Phe Thr Tyr Ala Ser Ala Leu Trp Glu Ile Gln Gln Val Val  
145 150 155 160

Asp Ala Asp Ser Lys Ile Val Gln Leu Ser Glu Ile Asn Met Asp Asn  
165 170 175

Ser Pro Asn Leu Ala Trp Pro Leu Ile Val Thr Ala Leu Arg Ala Asn  
180 185 190

Ser Ala Val Lys Leu Gln  
195

<210> 9773  
<211> 113  
<212> PRT  
<213> SARS coronavirus

<400> 9773

SEQLIST-20480.TXT

Asn Asn Glu Leu Ser Pro Val Ala Leu Arg Gln Met Ser Cys Ala Ala  
 1 5 10 15  
 Gly Thr Thr Gln Thr Ala Cys Thr Asp Asp Asn Ala Leu Ala Tyr Tyr  
 20 25 30  
 Asn Asn Ser Lys Gly Gly Arg Phe Val Leu Ala Leu Leu Ser Asp His  
 35 40 45  
 Gln Asp Leu Lys Trp Ala Arg Phe Pro Lys Ser Asp Gly Thr Gly Thr  
 50 55 60  
 Ile Tyr Thr Glu Leu Glu Pro Pro Cys Arg Phe Val Thr Asp Thr Pro  
 65 70 75 80  
 Lys Gly Pro Lys Val Lys Tyr Leu Tyr Phe Ile Lys Gly Leu Asn Asn  
 85 90 95  
 Leu Asn Arg Gly Met Val Leu Gly Ser Leu Ala Ala Thr Val Arg Leu  
 100 105 110

Gln

<210> 9774  
 <211> 139  
 <212> PRT  
 <213> SARS coronavirus

<400> 9774  
 Ala Gly Asn Ala Thr Glu Val Pro Ala Asn Ser Thr Val Leu Ser Phe  
 1 5 10 15  
 Cys Ala Phe Ala Val Asp Pro Ala Lys Ala Tyr Lys Asp Tyr Leu Ala  
 20 25 30  
 Ser Gly Gly Gln Pro Ile Thr Asn Cys Val Lys Met Leu Cys Thr His  
 35 40 45  
 Thr Gly Thr Gly Gln Ala Ile Thr Val Thr Pro Glu Ala Asn Met Asp  
 50 55 60  
 Gln Glu Ser Phe Gly Gly Ala Ser Cys Cys Leu Tyr Cys Arg Cys His  
 65 70 75 80  
 Ile Asp His Pro Asn Pro Lys Gly Phe Cys Asp Leu Lys Gly Lys Tyr  
 85 90 95  
 Val Gln Ile Pro Thr Thr Cys Ala Asn Asp Pro Val Gly Phe Thr Leu  
 100 105 110  
 Arg Asn Thr Val Cys Thr Val Cys Gly Met Trp Lys Gly Tyr Gly Cys  
 115 120 125  
 Ser Cys Asp Gln Leu Arg Glu Pro Leu Met Gln  
 130 135

<210> 9775  
 <211> 932  
 <212> PRT  
 <213> SARS coronavirus

<400> 9775

SEQLIST-20480.TXT

Ser Ala Asp Ala Ser Thr Phe Leu Asn Arg Val Cys Gly Val Ser Ala  
1 5 10 15  
Ala Arg Leu Thr Pro Cys Gly Thr Gly Thr Ser Thr Asp Val Val Tyr  
20 25 30  
Arg Ala Phe Asp Ile Tyr Asn Glu Lys Val Ala Gly Phe Ala Lys Phe  
35 40 45  
Leu Lys Thr Asn Cys Cys Arg Phe Gln Glu Lys Asp Glu Glu Gly Asn  
50 55 60  
Leu Leu Asp Ser Tyr Phe Val Val Lys Arg His Thr Met Ser Asn Tyr  
65 70 75 80  
Gln His Glu Glu Thr Ile Tyr Asn Leu Val Lys Asp Cys Pro Ala Val  
85 90 95  
Ala Val His Asp Phe Phe Lys Phe Arg Val Asp Gly Asp Met Val Pro  
100 105 110  
His Ile Ser Arg Gln Arg Leu Thr Lys Tyr Thr Met Ala Asp Leu Val  
115 120 125  
Tyr Ala Leu Arg His Phe Asp Glu Gly Asn Cys Asp Thr Leu Lys Glu  
130 135 140  
Ile Leu Val Thr Tyr Asn Cys Cys Asp Asp Asp Tyr Phe Asn Lys Lys  
145 150 155 160  
Asp Trp Tyr Asp Phe Val Glu Asn Pro Asp Ile Leu Arg Val Tyr Ala  
165 170 175  
Asn Leu Gly Glu Arg Val Arg Gln Ser Leu Leu Lys Thr Val Gln Phe  
180 185 190  
Cys Asp Ala Met Arg Asp Ala Gly Ile Val Gly Val Leu Thr Leu Asp  
195 200 205  
Asn Gln Asp Leu Asn Gly Asn Trp Tyr Asp Phe Gly Asp Phe Val Gln  
210 215 220  
Val Ala Pro Gly Cys Gly Val Pro Ile Val Asp Ser Tyr Tyr Ser Leu  
225 230 235 240  
Leu Met Pro Ile Leu Thr Leu Thr Arg Ala Leu Ala Ala Glu Ser His  
245 250 255  
Met Asp Ala Asp Leu Ala Lys Pro Leu Ile Lys Trp Asp Leu Leu Lys  
260 265 270  
Tyr Asp Phe Thr Glu Glu Arg Leu Cys Leu Phe Asp Arg Tyr Phe Lys  
275 280 285  
Tyr Trp Asp Gln Thr Tyr His Pro Asn Cys Ile Asn Cys Leu Asp Asp  
290 295 300  
Arg Cys Ile Leu His Cys Ala Asn Phe Asn Val Leu Phe Ser Thr Val  
305 310 315 320  
Phe Pro Pro Thr Ser Phe Gly Pro Leu Val Arg Lys Ile Phe Val Asp  
325 330 335



SEQLIST-20480.TXT

Gly Val Pro Phe Val Val Ser Thr Gly Tyr His Phe Arg Glu Leu Gly  
340 345 350

Val Val His Asn Gln Asp Val Asn Leu His Ser Ser Arg Leu Ser Phe  
355 360 365

Lys Glu Leu Leu Val Tyr Ala Ala Asp Pro Ala Met His Ala Ala Ser  
370 375 380

Gly Asn Leu Leu Leu Asp Lys Arg Thr Thr Cys Phe Ser Val Ala Ala  
385 390 395 400

Leu Thr Asn Asn Val Ala Phe Gln Thr Val Lys Pro Gly Asn Phe Asn  
405 410 415

Lys Asp Phe Tyr Asp Phe Ala Val Ser Lys Gly Phe Phe Lys Glu Gly  
420 425 430

Ser Ser Val Glu Leu Lys His Phe Phe Phe Ala Gln Asp Gly Asn Ala  
435 440 445

Ala Ile Ser Asp Tyr Asp Tyr Tyr Arg Tyr Asn Leu Pro Thr Met Cys  
450 455 460

Asp Ile Arg Gln Leu Leu Phe Val Val Glu Val Val Asp Lys Tyr Phe  
465 470 475 480

Asp Cys Tyr Asp Gly Gly Cys Ile Asn Ala Asn Gln Val Ile Val Asn  
485 490 495

Asn Leu Asp Lys Ser Ala Gly Phe Pro Phe Asn Lys Trp Gly Lys Ala  
500 505 510

Arg Leu Tyr Tyr Asp Ser Met Ser Tyr Glu Asp Gln Asp Ala Leu Phe  
515 520 525

Ala Tyr Thr Lys Arg Asn Val Ile Pro Thr Ile Thr Gln Met Asn Leu  
530 535 540

Lys Tyr Ala Ile Ser Ala Lys Asn Arg Ala Arg Thr Val Ala Gly Val  
545 550 555 560

Ser Ile Cys Ser Thr Met Thr Asn Arg Gln Phe His Gln Lys Leu Leu  
565 570 575

Lys Ser Ile Ala Ala Thr Arg Gly Ala Thr Val Val Ile Gly Thr Ser  
580 585 590

Lys Phe Tyr Gly Gly Trp His Asn Met Leu Lys Thr Val Tyr Ser Asp  
595 600 605

Val Glu Thr Pro His Leu Met Gly Trp Asp Tyr Pro Lys Cys Asp Arg  
610 615 620

Ala Met Pro Asn Met Leu Arg Ile Met Ala Ser Leu Val Leu Ala Arg  
625 630 635 640

Lys His Asn Thr Cys Cys Asn Leu Ser His Arg Phe Tyr Arg Leu Ala  
645 650 655

Asn Glu Cys Ala Gln Val Leu Ser Glu Met Val Met Cys Gly Gly Ser  
660 665 670

SEQLIST-20480.TXT

Leu Tyr Val Lys Pro Gly Gly Thr Ser Ser Gly Asp Thr Thr Ala  
675 680 685

Tyr Ala Asn Ser Val Phe Asn Ile Cys Gln Ala Val Thr Ala Asn Val  
690 695 700

Asn Ala Leu Leu Ser Thr Asp Gly Asn Lys Ile Ala Asp Lys Tyr Val  
705 710 715 720

Arg Asn Leu Gln His Arg Leu Tyr Glu Cys Leu Tyr Arg Asn Arg Asp  
725 730 735

Val Asp His Glu Phe Val Asp Glu Phe Tyr Ala Tyr Leu Arg Lys His  
740 745 750

Phe Ser Met Met Ile Leu Ser Asp Asp Ala Val Val Cys Tyr Asn Ser  
755 760 765

Asn Tyr Ala Ala Gln Gly Leu Val Ala Ser Ile Lys Asn Phe Lys Ala  
770 775 780

Val Leu Tyr Tyr Gln Asn Asn Val Phe Met Ser Glu Ala Lys Cys Trp  
785 790 795 800

Thr Glu Thr Asp Leu Thr Lys Gly Pro His Glu Phe Cys Ser Gln His  
805 810 815

Thr Met Leu Val Lys Gln Gly Asp Asp Tyr Val Tyr Leu Pro Tyr Pro  
820 825 830

Asp Pro Ser Arg Ile Leu Gly Ala Gly Cys Phe Val Asp Asp Ile Val  
835 840 845

Lys Thr Asp Gly Thr Leu Met Ile Glu Arg Phe Val Ser Leu Ala Ile  
850 855 860

Asp Ala Tyr Pro Leu Thr Lys His Pro Asn Gln Glu Tyr Ala Asp Val  
865 870 875 880

Phe His Leu Tyr Leu Gln Tyr Ile Arg Lys Leu His Asp Glu Leu Thr  
885 890 895

Gly His Met Leu Asp Met Tyr Ser Val Met Leu Thr Asn Asp Asn Thr  
900 905 910

Ser Arg Tyr Trp Glu Pro Glu Phe Tyr Glu Ala Met Tyr Thr Pro His  
915 920 925

Thr Val Leu Gln  
930

<210> 9776  
<211> 601  
<212> PRT  
<213> SARS coronavirus

<400> 9776  
Ala Val Gly Ala Cys Val Leu Cys Asn Ser Gln Thr Ser Leu Arg Cys  
1 5 10 15  
Gly Ala Cys Ile Arg Arg Pro Phe Leu Cys Cys Lys Cys Cys Tyr Asp  
20 25 30

SEQLIST-20480.TXT

His Val Ile Ser Thr Ser His Lys Leu Val Leu Ser Val Asn Pro Tyr  
35 40 45  
Val Cys Asn Ala Pro Gly Cys Asp Val Thr Asp Val Thr Gln Leu Tyr  
50 55 60  
Leu Gly Gly Met Ser Tyr Tyr Cys Lys Ser His Lys Pro Pro Ile Ser  
65 70 75 80  
Phe Pro Leu Cys Ala Asn Gly Gln Val Phe Gly Leu Tyr Lys Asn Thr  
85 90 95  
Cys Val Gly Ser Asp Asn Val Thr Asp Phe Asn Ala Ile Ala Thr Cys  
100 105 110  
Asp Trp Thr Asn Ala Gly Asp Tyr Ile Leu Ala Asn Thr Cys Thr Glu  
115 120 125  
Arg Leu Lys Leu Phe Ala Ala Glu Thr Leu Lys Ala Thr Glu Glu Thr  
130 135 140  
Phe Lys Leu Ser Tyr Gly Ile Ala Thr Val Arg Glu Val Leu Ser Asp  
145 150 155 160  
Arg Glu Leu His Leu Ser Trp Glu Val Gly Lys Pro Arg Pro Pro Leu  
165 170 175  
Asn Arg Asn Tyr Val Phe Thr Gly Tyr Arg Val Thr Lys Asn Ser Lys  
180 185 190  
Val Gln Ile Gly Glu Tyr Thr Phe Glu Lys Gly Asp Tyr Gly Asp Ala  
195 200 205  
Val Val Tyr Arg Gly Thr Thr Thr Tyr Lys Leu Asn Val Gly Asp Tyr  
210 215 220  
Phe Val Leu Thr Ser His Thr Val Met Pro Leu Ser Ala Pro Thr Leu  
225 230 235 240  
Val Pro Gln Glu His Tyr Val Arg Ile Thr Gly Leu Tyr Pro Thr Leu  
245 250 255  
Asn Ile Ser Asp Glu Phe Ser Ser Asn Val Ala Asn Tyr Gln Lys Val  
260 265 270  
Gly Met Gln Lys Tyr Ser Thr Leu Gln Gly Pro Pro Gly Thr Gly Lys  
275 280 285  
Ser His Phe Ala Ile Gly Leu Ala Leu Tyr Tyr Pro Ser Ala Arg Ile  
290 295 300  
Val Tyr Thr Ala Cys Ser His Ala Ala Val Asp Ala Leu Cys Glu Lys  
305 310 315 320  
Ala Leu Lys Tyr Leu Pro Ile Asp Lys Cys Ser Arg Ile Ile Pro Ala  
325 330 335  
Arg Ala Arg Val Glu Cys Phe Asp Lys Phe Lys Val Asn Ser Thr Leu  
340 345 350  
Glu Gln Tyr Val Phe Cys Thr Val Asn Ala Leu Pro Glu Thr Thr Ala  
355 360 365

SEQLIST-20480.TXT

Asp Ile Val Val Phe Asp Glu Ile Ser Met Ala Thr Asn Tyr Asp Leu  
 370 375 380  
 Ser Val Val Asn Ala Arg Leu Arg Ala Lys His Tyr Val Tyr Ile Gly  
 385 390 400  
 Asp Pro Ala Gln Leu Pro Ala Pro Arg Thr Leu Leu Thr Lys Gly Thr  
 405 410 415  
 Leu Glu Pro Glu Tyr Phe Asn Ser Val Cys Arg Leu Met Lys Thr Ile  
 420 425 430  
 Gly Pro Asp Met Phe Leu Gly Thr Cys Arg Arg Cys Pro Ala Glu Ile  
 435 440 445  
 Val Asp Thr Val Ser Ala Leu Val Tyr Asp Asn Lys Leu Lys Ala His  
 450 455 460  
 Lys Asp Lys Ser Ala Gln Cys Phe Lys Met Phe Tyr Lys Gly Val Ile  
 465 470 475 480  
 Thr His Asp Val Ser Ser Ala Ile Asn Arg Pro Gln Ile Gly Val Val  
 485 490 495  
 Arg Glu Phe Leu Thr Arg Asn Pro Ala Trp Arg Lys Ala Val Phe Ile  
 500 505 510  
 Ser Pro Tyr Asn Ser Gln Asn Ala Val Ala Ser Lys Ile Leu Gly Leu  
 515 520 525  
 Pro Thr Gln Thr Val Asp Ser Ser Gln Gly Ser Glu Tyr Asp Tyr Val  
 530 535 540  
 Ile Phe Thr Gln Thr Thr Glu Thr Ala His Ser Cys Asn Val Asn Arg  
 545 550 555 560  
 Phe Asn Val Ala Ile Thr Arg Ala Lys Ile Gly Ile Leu Cys Ile Met  
 565 570 575  
 Ser Asp Arg Asp Leu Tyr Asp Lys Leu Gln Phe Thr Ser Leu Glu Ile  
 580 585 590  
 Pro Arg Arg Asn Val Ala Thr Leu Gln  
 595 600

<210> 9777  
 <211> 527  
 <212> PRT  
 <213> SARS coronavirus

<400> 9777  
 Ala Glu Asn Val Thr Gly Leu Phe Lys Asp Cys Ser Lys Ile Ile Thr  
 1 5 10 15  
 Gly Leu His Pro Thr Gln Ala Pro Thr His Leu Ser Val Asp Ile Lys  
 20 25 30  
 Phe Lys Thr Glu Gly Leu Cys Val Asp Ile Pro Gly Ile Pro Lys Asp  
 35 40 45  
 Met Thr Tyr Arg Arg Leu Ile Ser Met Met Gly Phe Lys Met Asn Tyr  
 50 55 60

SEQLIST-20480.TXT

Gln Val Asn Gly Tyr Pro Asn Met Phe Ile Thr Arg Glu Glu Ala Ile  
65 70 75 80

Arg His Val Arg Ala Trp Ile Gly Phe Asp Val Glu Gly Cys His Ala  
85 90 95

Thr Arg Asp Ala Val Gly Thr Asn Leu Pro Leu Gln Leu Gly Phe Ser  
100 105 110

Thr Gly Val Asn Leu Val Ala Val Pro Thr Gly Tyr Val Asp Thr Glu  
115 120 125

Asn Asn Thr Glu Phe Thr Arg Val Asn Ala Lys Pro Pro Pro Gly Asp  
130 135 140

Gln Phe Lys His Leu Ile Pro Leu Met Tyr Lys Gly Leu Pro Trp Asn  
145 150 155 160

Val Val Arg Ile Lys Ile Val Gln Met Leu Ser Asp Thr Leu Lys Gly  
165 170 175

Leu Ser Asp Arg Val Val Phe Val Leu Trp Ala His Gly Phe Glu Leu  
180 185 190

Thr Ser Met Lys Tyr Phe Val Lys Ile Gly Pro Glu Arg Thr Cys Cys  
195 200 205

Leu Cys Asp Lys Arg Ala Thr Cys Phe Ser Thr Ser Ser Asp Thr Tyr  
210 215 220

Ala Cys Trp Asn His Ser Val Gly Phe Asp Tyr Val Tyr Asn Pro Phe  
225 230 235 240

Met Ile Asp Val Gln Gln Trp Gly Phe Thr Gly Asn Leu Gln Ser Asn  
245 250 255

His Asp Gln His Cys Gln Val His Gly Asn Ala His Val Ala Ser Cys  
260 265 270

Asp Ala Ile Met Thr Arg Cys Leu Ala Val His Glu Cys Phe Val Lys  
275 280 285

Arg Val Asp Trp Ser Val Glu Tyr Pro Ile Ile Gly Asp Glu Leu Arg  
290 295 300

Val Asn Ser Ala Cys Arg Lys Val Gln His Met Val Val Lys Ser Ala  
305 310 315 320

Leu Leu Ala Asp Lys Phe Pro Val Leu His Asp Ile Gly Asn Pro Lys  
325 330 335

Ala Ile Lys Cys Val Pro Gln Ala Glu Val Glu Trp Lys Phe Tyr Asp  
340 345 350

Ala Gln Pro Cys Ser Asp Lys Ala Tyr Lys Ile Glu Glu Leu Phe Tyr  
355 360 365

Ser Tyr Ala Thr His His Asp Lys Phe Thr Asp Gly Val Cys Leu Phe  
370 375 380

Trp Asn Cys Asn Val Asp Arg Tyr Pro Ala Asn Ala Ile Val Cys Arg  
385 390 395 400

SEQLIST-20480.TXT

Phe Asp Thr Arg Val Leu Ser Asn Leu Asn Leu Pro Gly Cys Asp Gly  
405 410  
Gly Ser Leu Tyr Val Asn Lys His Ala Phe His Thr Pro Ala Phe Asp  
420 425 430  
Lys Ser Ala Phe Thr Asn Leu Lys Gln Leu Pro Phe Phe Tyr Tyr Ser  
435 440 445  
Asp Ser Pro Cys Glu Ser His Gly Lys Gln Val Val Ser Asp Ile Asp  
450 455 460  
Tyr Val Pro Leu Lys Ser Ala Thr Cys Ile Thr Arg Cys Asn Leu Gly  
465 470 475 480  
Gly Ala Val Cys Arg His His Ala Asn Glu Tyr Arg Gln Tyr Leu Asp  
485 490 495  
Ala Tyr Asn Met Met Ile Ser Ala Gly Phe Ser Leu Trp Ile Tyr Lys  
500 505 510  
Gln Phe Asp Thr Tyr Asn Leu Trp Asn Thr Phe Thr Arg Leu Gln  
515 520 525  
<210> 9778  
<211> 346  
<212> PRT  
<213> SARS coronavirus  
<400> 9778  
Ser Leu Glu Asn Val Ala Tyr Asn Val Val Asn Lys Gly His Phe Asp  
1 5 10 15  
Gly His Ala Gly Glu Ala Pro Val Ser Ile Ile Asn Asn Ala Val Tyr  
20 25 30  
Thr Lys Val Asp Gly Ile Asp Val Glu Ile Phe Glu Asn Lys Thr Thr  
35 40 45  
Leu Pro Val Asn Val Ala Phe Glu Leu Trp Ala Lys Arg Asn Ile Lys  
50 55 60  
Pro Val Pro Glu Ile Lys Ile Leu Asn Asn Leu Gly Val Asp Ile Ala  
65 70 75 80  
Ala Asn Thr Val Ile Trp Asp Tyr Lys Arg Glu Ala Pro Ala His Val  
85 90 95  
Ser Thr Ile Gly Val Cys Thr Met Thr Asp Ile Ala Lys Lys Pro Thr  
100 105 110  
Glu Ser Ala Cys Ser Ser Leu Thr Val Leu Phe Asp Gly Arg Val Glu  
115 120 125  
Gly Gln Val Asp Leu Phe Arg Asn Ala Arg Asn Gly Val Leu Ile Thr  
130 135 140  
Glu Gly Ser Val Lys Gly Leu Thr Pro Ser Lys Gly Pro Ala Gln Ala  
145 150 155 160  
Ser Val Asn Gly Val Thr Leu Ile Gly Glu Ser Val Lys Thr Gln Phe  
165 170 175

SEQLIST-20480.TXT

Asn Tyr Phe Lys Lys Val Asp Gly Ile Ile Gln Gln Leu Pro Glu Thr  
180 185 190  
Tyr Phe Thr Gln Ser Arg Asp Leu Glu Asp Phe Lys Pro Arg Ser Gln  
195 200 205  
Met Glu Thr Asp Phe Leu Glu Leu Ala Met Asp Glu Phe Ile Gln Arg  
210 215 220  
Tyr Lys Leu Glu Gly Tyr Ala Phe Glu His Ile Val Tyr Gly Asp Phe  
225 230 235 240  
Ser His Gly Gln Leu Gly Gly Leu His Leu Met Ile Gly Leu Ala Lys  
245 250 255  
Arg Ser Gln Asp Ser Pro Leu Lys Leu Glu Asp Phe Ile Pro Met Asp  
260 265 270  
Ser Thr Val Lys Asn Tyr Phe Ile Thr Asp Ala Gln Thr Gly Ser Ser  
275 280 285  
Lys Cys Val Cys Ser Val Ile Asp Leu Leu Leu Asp Asp Phe Val Glu  
290 295 300  
Ile Ile Lys Ser Gln Asp Leu Ser Val Ile Ser Lys Val Val Lys Val  
305 310 315 320  
Thr Ile Asp Tyr Ala Glu Ile Ser Phe Met Leu Trp Cys Lys Asp Gly  
325 330 335  
His Val Glu Thr Phe Tyr Pro Lys Leu Gln  
340 345  
<210> 9779  
<211> 298  
<212> PRT  
<213> SARS coronavirus  
<400> 9779  
Ala Ser Arg Ala Trp Gln Pro Gly Val Ala Met Pro Asn Leu Tyr Lys  
1 5 10 15  
Met Gln Arg Met Leu Leu Glu Lys Cys Asp Leu Gln Asn Tyr Gly Glu  
20 25 30  
Asn Ala Val Ile Pro Lys Gly Ile Met Met Asn Val Ala Lys Tyr Thr  
35 40 45  
Gln Leu Cys Gln Tyr Leu Asn Thr Leu Thr Leu Ala Val Pro Tyr Asn  
50 55 60  
Met Arg Val Ile His Phe Gly Ala Gly Ser Asp Lys Gly Val Ala Pro  
65 70 75 80  
Gly Thr Ala Val Leu Arg Gln Trp Leu Pro Thr Gly Thr Leu Leu Val  
85 90 95  
Asp Ser Asp Leu Asn Asp Phe Val Ser Asp Ala Tyr Ser Thr Leu Ile  
100 105 110  
Gly Asp Cys Ala Thr Val His Thr Ala Asn Lys Trp Asp Leu Ile Ile  
115 120 125

SEQLIST-20480.TXT

Ser Asp Met Tyr Asp Pro Arg Thr Lys His Val Thr Lys Glu Asn Asp  
 130 135 140  
 Ser Lys Glu Gly Phe Phe Thr Tyr Leu Cys Gly Phe Ile Lys Gln Lys  
 145 150 155 160  
 Leu Ala Leu Gly Gly Ser Ile Ala Val Lys Ile Thr Glu His Ser Trp  
 165 170 175  
 Asn Ala Asp Leu Tyr Lys Leu Met Gly His Phe Ser Trp Trp Thr Ala  
 180 185 190  
 Phe Val Thr Asn Val Asn Ala Ser Ser Ser Glu Ala Phe Leu Ile Gly  
 195 200 205  
 Ala Asn Tyr Leu Gly Lys Pro Lys Glu Gln Ile Asp Gly Tyr Thr Met  
 210 215 220  
 His Ala Asn Tyr Ile Phe Trp Arg Asn Thr Asn Pro Ile Gln Leu Ser  
 225 230 235 240  
 Ser Tyr Ser Leu Phe Asp Met Ser Lys Phe Pro Leu Lys Leu Arg Gly  
 245 250 255  
 Thr Ala Val Met Ser Leu Lys Glu Asn Gln Ile Asn Asp Met Ile Tyr  
 260 265 270  
 Ser Leu Leu Glu Lys Gly Arg Leu Ile Ile Arg Glu Asn Asn Arg Val  
 275 280 285  
 Val Val Ser Ser Asp Ile Leu Val Asn Asn  
 290 295

<210> 9780  
 <211> 21  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Primer

<400> 9780  
 ttaggttttt acctacccag g 21

<210> 9781  
 <211> 22  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Primer

<400> 9781  
 ttcgttttaga gaacagatct ac 22

<210> 9782  
 <211> 21  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Probe



<400> 9782  
aagccaacca acctcgatct c 21

<210> 9783  
<211> 7  
<212> PRT  
<213> SARS coronavirus

<400> 9783  
Lys Lys Asp Lys Lys Lys Lys  
1 5

<210> 9784  
<211> 20  
<212> PRT  
<213> SARS coronavirus

<400> 9784  
Lys Lys Asp Lys Lys Lys Lys Thr Asp Glu Ala Gln Pro Leu Pro Gln  
1 5 10 15  
Arg Gln Lys Lys  
20

<210> 9785  
<211> 42  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Primer

<400> 9785  
agatcttcta gataaaagaa gtgacctga ccggtgcacc ac 42

<210> 9786  
<211> 50  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Primer

<400> 9786  
agatctccta ggcattcgcc atattgcttc atgaagccag catcagcgag 50

<210> 9787  
<211> 49  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Primer

<400> 9787  
agatctccta ggtgatatta atgctaggga cctcatttgt gcgcagaag 49

<210> 9788  
<211> 45  
<212> DNA  
<213> Artificial Sequence

<220>

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<223>    Primer
<400>    9788
agatctgtcg actcattatg tgtaatgtaa ttgacaccc ttgag      45
<210>    9789
<211>    44
<212>    DNA
<213>    Artificial Sequence

<220>
<223>    oligonucleotide
<400>    9789
tgagcatgtt gatacttctt atgagtgcga cattcctatt ggag      44
<210>    9790
<211>    39
<212>    DNA
<213>    Artificial Sequence

<220>
<223>    oligonucleotide
<400>    9790
ctggcatttg tgctagttac catacagttt ctttattac      39
<210>    9791
<211>    58
<212>    DNA
<213>    Artificial Sequence

<220>
<223>    oligonucleotide
<400>    9791
gtagtactag ccaaaaatct attgtggctt atactatgtc tttaggtgct gatagttc      58
<210>    9792
<211>    52
<212>    DNA
<213>    Artificial Sequence

<220>
<223>    oligonucleotide
<400>    9792
aattgaacta tcagcaccta aagacatagt ataagccaca atagattttt gg      52
<210>    9793
<211>    37
<212>    DNA
<213>    Artificial Sequence

<220>
<223>    oligonucleotide
<400>    9793
ctagtactac gtaataaaga aactgtatgg taactag      37
<210>    9794
<211>    53
<212>    DNA

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<213> Artificial Sequence
<220>
<223> oligonucleotide
<400> 9794
cacaaatgcc agctccaata ggaatgtcgc actcataaga agtatcaaca tgc 53
<210> 9795
<211> 29
<212> DNA
<213> Artificial Sequence
<220>
<223> oligonucleotide
<400> 9795
agcttacaaa acaaatgag tgaccttga 29
<210> 9796
<211> 29
<212> DNA
<213> Artificial Sequence
<220>
<223> oligonucleotide
<400> 9796
ccggtcaagg tcaactcattt tgttttgta 29
<210> 9797
<211> 68
<212> DNA
<213> Artificial Sequence
<220>
<223> oligonucleotide
<400> 9797
aaatgaatca ctcatcgacc ttcaagaatt gggaaaatat gagcaatata ttaaattggcc 60
ttaatgag 68
<210> 9798
<211> 72
<212> DNA
<213> Artificial Sequence
<220>
<223> oligonucleotide
<400> 9798
tcgactcatt aaggccattt aatatattgc tcatattttc ccaattcttg aagggtcaatg 60
agtgattcat tt 72
<210> 9799
<211> 650
<212> PRT
<213> SARS coronavirus
<400> 9799
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1 5 10 15

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SEQLIST-20480.TXT

Asn Tyr Thr Gln His Thr Ser Ser Met Arg Gly Val Tyr Pro Asp  
 20 25 30  
 Glu Ile Phe Arg Ser Asp Thr Leu Tyr Leu Thr Gln Asp Leu Phe Leu  
 35 40 45  
 Pro Phe Tyr Ser Asn Val Thr Gly Phe His Thr Ile Asn His Thr Phe  
 50 55 60  
 Gly Asn Pro Val Ile Pro Phe Lys Asp Gly Ile Tyr Phe Ala Ala Thr  
 65 70 75 80  
 Glu Lys Ser Asn Val Val Arg Gly Trp Val Phe Gly Ser Thr Met Asn  
 85 90 95  
 Asn Lys Ser Gln Ser Val Ile Ile Ile Asn Asn Ser Thr Asn Val Val  
 100 105 110  
 Ile Arg Ala Cys Asn Phe Glu Leu Cys Asp Asn Pro Phe Phe Ala Val  
 115 120 125  
 Ser Lys Pro Met Gly Thr Gln Thr His Thr Met Ile Phe Asp Asn Ala  
 130 135 140  
 Phe Asn Cys Thr Phe Glu Tyr Ile Ser Asp Ala Phe Ser Leu Asp Val  
 145 150 155 160  
 Ser Glu Lys Ser Gly Asn Phe Lys His Leu Arg Glu Phe Val Phe Lys  
 165 170 175  
 Asn Lys Asp Gly Phe Leu Tyr Val Tyr Lys Gly Tyr Gln Pro Ile Asp  
 180 185 190  
 Val Val Arg Asp Leu Pro Ser Gly Phe Asn Thr Leu Lys Pro Ile Phe  
 195 200 205  
 Lys Leu Pro Leu Gly Ile Asn Ile Thr Asn Phe Arg Ala Ile Leu Thr  
 210 215 220  
 Ala Phe Ser Pro Ala Gln Asp Ile Trp Gly Thr Ser Ala Ala Ala Tyr  
 225 230 235 240  
 Phe Val Gly Tyr Leu Lys Pro Thr Thr Phe Met Leu Lys Tyr Asp Glu  
 245 250 255  
 Asn Gly Thr Ile Thr Asp Ala Val Asp Cys Ser Gln Asn Pro Leu Ala  
 260 265 270  
 Glu Leu Lys Cys Ser Val Lys Ser Phe Glu Ile Asp Lys Gly Ile Tyr  
 275 280 285  
 Gln Thr Ser Asn Phe Arg Val Val Pro Ser Gly Asp Val Val Arg Phe  
 290 295 300  
 Pro Asn Ile Thr Asn Leu Cys Pro Phe Gly Glu Val Phe Asn Ala Thr  
 305 310 315 320  
 Lys Phe Pro Ser Val Tyr Ala Trp Glu Arg Lys Lys Ile Ser Asn Cys  
 325 330 335  
 Val Ala Asp Tyr Ser Val Leu Tyr Asn Ser Thr Phe Phe Ser Thr Phe  
 340 345 350

SEQLIST-20480.TXT

Lys Cys Tyr Gly Val Ser Ala Thr Lys Leu Asn Asp Leu Cys Phe Ser  
355 360 365  
Asn Val Tyr Ala Asp Ser Phe Val Val Lys Gly Asp Asp Val Arg Gln  
370 375 380  
Ile Ala Pro Gly Gln Thr Gly Val Ile Ala Asp Tyr Asn Tyr Lys Leu  
385 390 395 400  
Pro Asp Asp Phe Met Gly Cys Val Leu Ala Trp Asn Thr Arg Asn Ile  
405 410 415  
Asp Ala Thr Ser Thr Gly Asn Tyr Asn Tyr Lys Tyr Arg Tyr Leu Arg  
420 425 430  
His Gly Lys Leu Arg Pro Phe Glu Arg Asp Ile Ser Asn Val Pro Phe  
435 440 445  
Ser Pro Asp Gly Lys Pro Cys Thr Pro Pro Ala Leu Asn Cys Tyr Trp  
450 455 460  
Pro Leu Asn Asp Tyr Gly Phe Tyr Thr Thr Thr Gly Ile Gly Tyr Gln  
465 470 475 480  
Pro Tyr Arg Val Val Val Leu Ser Phe Glu Leu Leu Asn Ala Pro Ala  
485 490 495  
Thr Val Cys Gly Pro Lys Leu Ser Thr Asp Leu Ile Lys Asn Gln Cys  
500 505 510  
Val Asn Phe Asn Phe Asn Gly Leu Thr Gly Thr Gly Val Leu Thr Pro  
515 520 525  
Ser Ser Lys Arg Phe Gln Pro Phe Gln Gln Phe Gly Arg Asp Val Ser  
530 535 540  
Asp Phe Thr Asp Ser Val Arg Asp Pro Lys Thr Ser Glu Ile Leu Asp  
545 550 555 560  
Ile Ser Pro Cys Ser Phe Gly Gly Val Ser Val Ile Thr Pro Gly Thr  
565 570 575  
Asn Ala Ser Ser Glu Val Ala Val Leu Tyr Gln Asp Val Asn Cys Thr  
580 585 590  
Asp Val Ser Thr Ala Ile His Ala Asp Gln Leu Thr Pro Ala Trp Arg  
595 600 605  
Ile Tyr Ser Thr Gly Asn Asn Val Phe Gln Thr Gln Ala Gly Cys Leu  
610 615 620  
Ile Gly Ala Glu His Val Asp Thr Ser Tyr Glu Cys Asp Ile Pro Ile  
625 630 635 640  
Gly Ala Gly Ile Cys Ala Ser Tyr His Thr  
645 650

<210> 9800  
<211> 1978  
<212> DNA  
<213> Artificial Sequence  
<220>

SEQLIST-20480.TXT

<223> Spike sequence for expression in yeast

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<400> 9800
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tcctaattac actcaacata cttcatctat gagggggggt tactatcctg atgaaatttt 120
tagatcagac actcttttatt taactcagga ttatttttctt ccatttttatt ctaatgttac 180
agggtttcat actattaatc atacgtttgg caaccctgtc atacccttta aggatggat 240
ttattttgct gccacagaga aatcaaagtgt tgtccgtggt tgggtttttg gttctaccat 300
gaacaacaag tcacagtcgg tgattattat taacaattct actaatgttg ttatacgagc 360
atgtaacttt gaattgtgtg acaacccttt ctttgctgtt tctaaaccca tgggtacaca 420
gacacatact atgatattcg ataatgcatt taattgcact ttcgagtaca tatctgatgc 480
cttttcgctt gatgtttcag aaaagtcagg taattttaaa cacttacgag agtttgtgtt 540
taaaaaataa gatgggtttc tctatgttta taagggtctat caacctatag atgtagtctg 600
tgatctacct tctgggttta acactttgaa acctattttt aagttgcctc ttggtattaa 660
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Pro Phe Tyr Ser Asn Val Thr Gly Phe His Thr Ile Asn His Thr Phe
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SEQLIST-20480.TXT

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Lys Leu Pro Leu Gly Ile Asn Ile Thr Asn Phe Arg Ala Ile Leu Thr  
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Ala Phe Ser Pro Ala Gln Asp Ile Trp Gly Thr Ser Ala Ala Ala Tyr  
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Phe Val Gly Tyr Leu Lys Pro Thr Thr Phe Met Leu Lys Tyr Asp Glu  
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Asn Gly Thr Ile Thr Asp Ala Val Asp Cys Ser Gln Asn Pro Leu Ala  
260 265 270  
Glu Leu Lys Cys Ser Val Lys Ser Phe Glu Ile Asp Lys Gly Ile Tyr  
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Gln Thr Ser Asn Phe Arg Val Val Pro Ser Gly Asp Val Val Arg Phe  
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Pro Asn Ile Thr Asn Leu Cys Pro Phe Gly Glu Val Phe Asn Ala Thr  
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Lys Phe Pro Ser Val Tyr Ala Trp Glu Arg Lys Lys Ile Ser Asn Cys  
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370 375 380  
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Pro Asp Asp Phe Met Gly Cys Val Leu Ala Trp Asn Thr Arg Asn Ile  
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 485 490 495  
 Thr Val Cys Gly Pro Lys Leu Ser Thr Asp Leu Ile Lys Asn Gln Cys  
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SEQLIST-20480.TXT

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SEQLIST-20480.TXT

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SEQLIST-20480.TXT

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<400> 9874
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<220>
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<210>    9883
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<213>    Bovine coronavirus

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agaagagctc  aacccaagca  aactgctact tctcagcaac catcaggagg gaatgttgta    180
ccctactatt  cttggttctc  tgggaattact cagtttcaaa agggaaagga gtttgaattt    240
gcagagggac  aaggtgtgcc  tattgcacca ggagtcccag ctactgaagc taaggggtac    300
tggtagagac  acaacagacg  ttcctttaa  acagccgatg gcaaccagcg tcaattgctg    360
ccacgatggg  atttttacta  tcttggaaac ggaccgcatg ccaaagacca gtatggcacc    420
gacattgacg  gagtcttctg  ggtcgctagt aaccaggctg atgtcaatac cccggctgac    480
attctcgatc  gggacccaag  tagcgatgag gctattccga ctaggtttcc gcctggcacg    540
gtactccctc  agggttacta  tattgaaggc tcaggaagggt ctgctcctaa ttccagatct    600
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aatagaaccc  ctacctctgg  tgtaacacct gatattggctg atcaaattgc tagtcttggt    720
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gaaatcagac  agaaaatttt  gaataagccc cgccagaaga ggagcccaa taaacaatgc    840
actgttcagc  agtgttttgg  gaagagaggg cccaatcaga attttgggtg tggagaaatg    900
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cttgacgagc  cccagaagga  tgtttatgaa ttgcgctata atggtgcaat tagatttgac   1080
agtacacttt  caggttttga  gaccataatg aaggtgttga atgagaattt gaatgcatac   1140
caacaacaag  atggtatgat  gaatatgagt ccaaaaccac agcgtcagcg tggtcagaag   1200
aacggacaag  gagaaaatga  taatataagt gttgcagcgc caaaaagccg tgtgcagcaa   1260
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tatactgaag  acacctcaga  aatataa                                1347

<210>    9884
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<212>    DNA
<213>    Bovine coronavirus

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caatttgat  atacaagtcg  cagtatgttt  gtttatgtta  ttaagatgat  cattttgtgg    180
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acaacaact  tgatgtgtat  agatatgaag  ggaaggatgt  atgttaggcc  gataattgag    420
gactaccata  cccttacggg  cacaataata  cgtggtcatc  tttacatgca  aggtataaaa    480
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atggacaccg	cattgttgag	aaataatatc	taa			693

<210> 9885  
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ttatttggtg	acagtcgttc	agattgtaat	catgttggtt	ctaccaaccc	ccgtaattat	180
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aactccattt	ttagggagttt	tcactttact	gattttttata	attacacagg	cgaagggtcaa	300
caaattattt	tctatgaggg	tgtaaatatt	acgccttatc	atgcctttta	atgcaccact	360
tctggtagta	atgatatttg	gatgcagaat	aaaggcttgt	tttactactca	ggttttataag	420
aataatggctg	tgtatcgcag	ccttactttt	gttaatgtac	catatgttta	taatggctct	480
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ggttgtgacg	agtagatcgt	accactttgt	attttcaacg	gcaagttttt	gtcgaataca	660
aagtattatg	atgatagtca	atattatttt	aataaagaca	ctgggtgttat	ttatgggtctc	720
aatttctactg	aaaccattac	cactggtttt	gatttttaatt	gtcattattt	agttctaccc	780
tctggttaatt	atttagccat	ttcaaatgag	ctattgttaa	ctgttcctac	taaagcaatc	840
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gccaggcagt	ctgataacat	gacggcagtt	gcttggtcaac	ccccgtactg	ttattttcgt	960
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tatgataatg	ttagcagtg	ctggcctctc	taccctatg	gcagatgcc	tactgctgct	1140
gatattaata	cccctgatgt	acctatttgt	gtgtatgatc	cgctaccaat	tattttgctt	1200
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Phe Pro Trp Met Phe Glu Asp Ala Glu Glu Lys Leu Asp Asn Pro Ser	
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Ser Ser Glu Val Asp Ile Val Cys Ser Thr Thr Ala Gln Lys Leu Glu	
35 40 45	
Thr Gly Gly Ile Cys Pro Glu Asn His Val Met Val Asp Cys Arg Arg	
50 55 60	
Leu Leu Lys Gln Glu Cys Cys Val Gln Ser Ser Leu Ile Arg Glu Ile	
65 70 75 80	
Val Met Asn Thr Arg Pro Tyr Asp Leu Glu Val Leu Leu Gln Asp Ala	
85 90 95	
Leu Gln Ser Arg Glu Ala Val Leu Val Thr Pro Pro Leu Gly Met Ser	
100 105 110	
Leu Glu Ala Cys Tyr Val Arg Gly Cys Asn Pro Asn Gly Trp Thr Met	
115 120 125	

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Gly Leu Phe Arg Arg Arg Ser Val Cys Asn Thr Gly Arg Cys Ala Val  
130 135 140  
Asn Lys His Val Ala Tyr Gln Leu Tyr Met Ile Asp Pro Ala Gly Val  
145 150 155 160  
Cys Phe Gly Ala Gly Gln Phe Val Gly Trp Val Ile Pro Leu Ala Phe  
165 170 175  
Met Pro Val Gln Ser Arg Lys Phe Ile Val Pro Trp Val Met Tyr Leu  
180 185 190  
Arg Lys Cys Gly Glu Lys Gly Ala Tyr Asn Lys Asp His Lys Arg Gly  
195 200 205  
Gly Phe Glu His Val Tyr Asn Phe Lys Val Glu Asp Ala Tyr Asp Leu  
210 215 220  
Val His Asp Glu Pro Lys Gly Lys Phe Ser Lys Lys Ala Tyr Ala Leu  
225 230 235 240  
Ile Arg Gly Tyr Arg Gly Val Lys Pro Leu Leu Tyr Val Asp Gln Tyr  
245 250 255  
Gly Cys Asp Tyr Thr Gly Gly Leu Ala Asp Gly Leu Glu Ala Tyr Ala  
260 265 270  
Asp Lys Thr Leu Gln Glu Met Lys Ala Leu Phe Pro Ile Trp Ser Gln  
275 280 285  
Glu Leu Pro Phe Asp Val Thr Val Ala Trp His Val Val Arg Asp Pro  
290 295 300  
Arg Tyr Val Met Arg Leu Gln Ser Ala Ser Thr Ile Arg Ser Val Ala  
305 310 315 320  
Tyr Val Ala Asn Pro Thr Glu Asp Leu Cys Asp Gly Ser Val Val Ile  
325 330 335  
Lys Glu Pro Val His Val Tyr Ala Asp Ser Ile Ile Leu Arg Gln  
340 345 350  
His Asn Leu Val Asp Ile Met Ser Cys Phe Tyr Met Glu Ala Asp Ala  
355 360 365  
Val Val Asn Ala Phe Tyr Gly Val Asp Leu Lys Asp Cys Gly Phe Val  
370 375 380  
Met Gln Phe Gly Tyr Ile Asp Cys Glu Gln Asp Leu Cys Asp Phe Lys  
385 390 395 400  
Gly Trp Val Pro Gly Asn Met Ile Asp Gly Phe Ala Cys Thr Thr Cys  
405 410 415  
Gly His Val Tyr Glu Thr Gly Asp Leu Leu Ala Gln Ser Ser Gly Val  
420 425 430  
Leu Pro Val Asn Pro Val Leu His Thr Lys Ser Ala Ala Gly Tyr Gly  
435 440 445  
Gly Phe Gly Cys Lys Asp Ser Phe Thr Leu Tyr Gly Gln Thr Val Val  
450 455 460

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Tyr Phe Gly Gly Cys Val Tyr Trp Ser Pro Ala Arg Asn Ile Trp Ile  
 465 470 475 480  
 Pro Ile Leu Lys Ser Ser Val Lys Ser Tyr Asp Gly Leu Val Tyr Thr  
 485 490 495  
 Gly Val Val Gly Cys Lys Ala Ile Val Lys Glu Thr Asn Leu Ile Cys  
 500 505 510  
 Lys Ala Leu Tyr Leu Asp Tyr Val Gln His Lys Cys Gly Asn Leu His  
 515 520 525  
 Gln Arg Glu Leu Leu Gly Val Ser Asp Val Trp His Lys Gln Leu Leu  
 530 535 540  
 Leu Asn Arg Gly Val Tyr Lys Pro Leu Leu Glu Asn Ile Asp Tyr Phe  
 545 550 555 560  
 Asn Met Arg Arg Ala Lys Phe Ser Leu Glu Thr Phe Thr Val Cys Ala  
 565 570 575  
 Asp Gly Phe Met Pro Phe Leu Leu Asp Asp Leu Val Pro Arg Ala Tyr  
 580 585 590  
 Tyr Leu Ala Val Ser Gly Gln Ala Phe Cys Asp Tyr Ala Asp Lys Ile  
 595 600 605  
 Cys His Ala Val Val Ser Lys Ser Lys Glu Leu Leu Asp Val Ser Leu  
 610 615 620  
 Asp Ser Leu Ser Ala Ala Ile His Tyr Leu Asn Ser Lys Ile Val Asp  
 625 630 635 640  
 Leu Ala Gln His Phe Ser Asp Phe Gly Thr Ser Phe Val Ser Lys Ile  
 645 650 655  
 Val His Phe Phe Lys Thr Phe Thr Thr Ser Thr Ala Leu Ala Phe Ala  
 660 665 670  
 Trp Val Leu Phe His Val Leu His Gly Ala Tyr Ile Val Val Glu Ser  
 675 680 685  
 Asp Ile Tyr Phe Val Lys Asn Ile Pro Arg Tyr Ala Ser Ala Val Ala  
 690 695 700  
 Gln Ala Phe Arg Ser Val Ala Lys Val Val Leu Asp Ser Leu Arg Val  
 705 710 715 720  
 Thr Phe Ile Asp Gly Leu Ser Cys Phe Lys Ile Gly Arg Arg Arg Ile  
 725 730 735  
 Cys Leu Ser Gly Ser Lys Ile Tyr Glu Val Glu Arg Gly Leu Leu His  
 740 745 750  
 Ser Ser Gln Leu Pro Leu Asp Val Tyr Asp Leu Thr Met Pro Ser Gln  
 755 760 765  
 Val Gln Lys Ala Lys Gln Lys Pro Ile Tyr Leu Lys Gly Ser Gly Ser  
 770 775 780  
 Asp Phe Ser Leu Ala Asp Ser Val Val Glu Val Val Thr Thr Ser Leu  
 785 790 795 800

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Thr Pro Cys Gly Tyr Ser Glu Pro Pro Lys Val Ala Asp Lys Ile Cys  
805 810 815

Ile Val Asp Asn Val Tyr Met Ala Lys Ala Gly Asp Lys Tyr Tyr Pro  
820 825 830

Val Val Val Asp Gly His Val Gly Leu Leu Asp Gln Ala Trp Arg Val  
835 840 845

Pro Cys Ala Gly Arg Arg Val Thr Phe Lys Glu Gln Pro Thr Val Asn  
850 855 860

Glu Ile Ala Ser Thr Pro Lys Thr Ile Lys Val Phe Tyr Glu Leu Asp  
865 870 875 880

Lys Asp Phe Asn Thr Ile Leu Asn Thr Ala Cys Gly Val Phe Glu Val  
885 890 895

Asp Asp Thr Val Asp Met Glu Glu Phe Tyr Ala Val Val Ile Asp Ala  
900 905 910

Ile Glu Glu Lys Leu Ser Pro Cys Lys Glu Leu Glu Gly Val Gly Ala  
915 920 925

Lys Val Ser Ala Phe Leu Gln Lys Leu Glu Asp Asn Ser Leu Phe Leu  
930 935 940

Phe Asp Glu Ala Gly Glu Glu Val Leu Ala Ser Lys Leu Tyr Cys Ala  
945 950 955 960

Phe Thr Ala Pro Glu Asp Asp Asp Phe Leu Glu Glu Ser Gly Val Glu  
965 970 975

Glu Asp Asp Val Glu Gly Glu Glu Thr Asp Leu Thr Val Thr Ser Ala  
980 985 990

Gly Glu Pro Cys Val Ala Ser Glu Gln Glu Glu Ser Ser Glu Ile Leu  
995 1000 1005

Glu Asp Thr Leu Asp Asp Gly Pro Cys Val Glu Thr Ser Asp Ser Gln  
1010 1015 1020

Val Glu Glu Asp Val Glu Met Ser Asp Phe Ala Asp Leu Glu Ser Val  
1025 1030 1035 1040

Ile Gln Asp Tyr Glu Asn Val Cys Phe Glu Phe Tyr Thr Thr Glu Pro  
1045 1050 1055

Glu Phe Val Lys Val Leu Asp Leu Tyr Val Pro Lys Ala Thr Arg Asn  
1060 1065 1070

Asn Cys Trp Leu Arg Ser Val Leu Ala Val Met Gln Lys Leu Pro Cys  
1075 1080 1085

Gln Phe Lys Asp Lys Asn Leu Gln Asp Leu Trp Val Leu Tyr Lys Gln  
1090 1095 1100

Gln Tyr Ser Gln Leu Phe Val Asp Thr Leu Val Asn Lys Ile Pro Ala  
1105 1110 1115 1120

Asn Ile Val Val Pro Gln Gly Gly Tyr Val Ala Asp Phe Ala Tyr Trp  
1125 1130 1135

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Phe Leu Thr Leu Cys Asp Trp Gln Cys Val Ala Tyr Trp Lys Cys Ile  
 1140 1145 1150  
 Lys Cys Asp Leu Ala Leu Lys Leu Lys Gly Leu Asp Ala Met Phe Phe  
 1155 1160 1165  
 Tyr Gly Asp Val Val Ser His Val Cys Lys Cys Gly Glu Ser Met Val  
 1170 1175 1180  
 Leu Ile Asp Val Asp Val Pro Phe Thr Ala His Phe Ala Leu Lys Asp  
 1185 1190 1195 1200  
 Lys Leu Phe Cys Ala Phe Ile Thr Lys Arg Ser Val Tyr Lys Ala Ala  
 1205 1210 1215  
 Cys Val Val Asp Val Asn Asp Ser His Ser Met Ala Val Val Asp Gly  
 1220 1225 1230  
 Lys Gln Ile Asp Asp His Arg Val Thr Ser Ile Thr Ser Asp Lys Phe  
 1235 1240 1245  
 Asp Phe Ile Ile Gly His Gly Met Ser Phe Ser Met Thr Thr Phe Glu  
 1250 1255 1260  
 Ile Ala Gln Leu Tyr Gly Ser Cys Ile Thr Pro Asn Val Cys Phe Val  
 1265 1270 1275 1280  
 Lys Gly Asp Ile Ile Lys Val Ser Lys Arg Val Lys Ala Glu Val Val  
 1285 1290 1295  
 Val Asn Pro Ala Asn Gly His Met Ala His Gly Gly Gly Val Ala Lys  
 1300 1305 1310  
 Ala Ile Ala Val Ala Ala Gly Gln Gln Phe Val Lys Glu Thr Thr Asp  
 1315 1320 1325  
 Met Val Lys Ser Lys Gly Val Cys Ala Thr Gly Asp Cys Tyr Val Ser  
 1330 1335 1340  
 Thr Gly Gly Lys Leu Cys Lys Thr Val Leu Asn Val Val Gly Pro Asp  
 1345 1350 1355 1360  
 Ala Arg Thr Gln Gly Lys Gln Ser Tyr Ala Leu Leu Glu Arg Val Tyr  
 1365 1370 1375  
 Lys His Leu Asn Lys Tyr Asp Cys Val Val Thr Thr Leu Ile Ser Ala  
 1380 1385 1390  
 Gly Ile Phe Ser Val Pro Ser Asp Val Ser Leu Thr Tyr Leu Leu Gly  
 1395 1400 1405  
 Thr Ala Glu Lys Gln Val Val Leu Val Ser Asn Asn Gln Glu Asp Phe  
 1410 1415 1420  
 Asp Leu Ile Ser Lys Cys Gln Ile Thr Ala Val Glu Gly Thr Lys Lys  
 1425 1430 1435 1440  
 Leu Ala Glu Arg Leu Ser Phe Asn Val Gly Arg Ser Ile Val Tyr Glu  
 1445 1450 1455  
 Thr Asp Ala Asn Lys Leu Ile Leu Ser Asn Asp Val Ala Phe Val Ser  
 1460 1465 1470

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Thr Phe Asn Val Leu Gln Asp Val Leu Ser Leu Arg His Asp Ile Ala  
1475 1480 1485

Leu Asp Asp Asp Ala Arg Thr Phe Val Gln Ser Asn Val Asp Val Val  
1490 1495 1500

Pro Glu Gly Trp Arg Val Val Asn Lys Phe Tyr Gln Ile Asn Gly Val  
1505 1510 1515 1520

Arg Thr Val Lys Tyr Phe Glu Cys Pro Gly Gly Ile Asp Ile Cys Ser  
1525 1530 1535

Gln Asp Lys Val Phe Gly Tyr Val Gln Gln Gly Ser Phe Asn Lys Ala  
1540 1545 1550

Thr Val Ala Gln Ile Lys Ala Leu Phe Leu Asp Lys Val Asp Ile Leu  
1555 1560 1565

Leu Thr Val Asp Gly Val Asn Phe Thr Asn Arg Phe Val Pro Val Gly  
1570 1575 1580

Glu Ser Phe Gly Lys Ser Leu Gly Asn Val Phe Cys Asp Gly Val Asn  
1585 1590 1595 1600

Val Thr Lys His Lys Cys Asp Ile Asn Tyr Lys Gly Lys Val Phe Phe  
1605 1610 1615

Gln Phe Asp Asn Leu Ser Ser Glu Asp Leu Lys Ala Val Arg Ser Ser  
1620 1625 1630

Phe Asn Phe Asp Gln Lys Glu Leu Leu Ala Tyr Tyr Asn Met Leu Val  
1635 1640 1645

Asn Cys Ser Lys Trp Gln Val Val Phe Asn Gly Lys Tyr Phe Thr Phe  
1650 1655 1660

Lys Gln Ala Asn Asn Asn Cys Phe Val Asn Val Ser Cys Leu Met Leu  
1665 1670 1675 1680

Gln Ser Leu Asn Leu Lys Phe Lys Ile Val Gln Trp Gln Glu Ala Trp  
1685 1690 1695

Leu Glu Phe Arg Ser Gly Arg Pro Ala Arg Phe Val Ser Leu Val Leu  
1700 1705 1710

Ala Lys Gly Gly Phe Lys Phe Gly Asp Pro Ala Asp Ser Arg Asp Phe  
1715 1720 1725

Leu Arg Val Val Phe Ser Gln Val Asp Leu Thr Gly Ala Ile Cys Asp  
1730 1735 1740

Phe Glu Ile Ala Cys Lys Cys Gly Val Lys Gln Glu Gln Arg Thr Gly  
1745 1750 1755 1760

Val Asp Ala Val Met His Phe Gly Thr Leu Ser Arg Glu Asp Leu Glu  
1765 1770 1775

Ile Gly Tyr Thr Val Asp Cys Ser Cys Gly Lys Lys Leu Ile His Cys  
1780 1785 1790

Val Arg Phe Asp Val Pro Phe Leu Ile Cys Ser Asn Thr Pro Ala Ser  
1795 1800 1805

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Val Lys Leu Pro Lys Gly Val Gly Ser Ala Asn Ile Phe Lys Gly Asp  
1810 1815 1820

Lys Val Gly His Tyr Val His Val Lys Cys Glu Gln Ser Tyr Gln Leu  
1825 1830 1835 1840

Tyr Asp Ala Ser Asn Val Lys Lys Val Thr Asp Val Thr Gly Asn Leu  
1845 1850 1855

Ser Asp Cys Leu Tyr Leu Lys Asn Leu Lys Gln Thr Phe Lys Ser Val  
1860 1865 1870

Leu Thr Thr Tyr Tyr Leu Asp Asp Val Lys Lys Ile Glu Tyr Asn Pro  
1875 1880 1885

Asp Leu Ser Gln Tyr Tyr Cys Asp Gly Gly Lys Tyr Tyr Thr Gln Arg  
1890 1895 1900

Ile Ile Lys Ala Gln Phe Lys Thr Phe Glu Lys Val Asp Gly Val Tyr  
1905 1910 1915 1920

Thr Asn Phe Lys Leu Ile Gly His Thr Ile Cys Asp Ile Leu Asn Ala  
1925 1930 1935

Lys Leu Gly Phe Asp Ser Ser Lys Glu Phe Val Glu Tyr Lys Val Thr  
1940 1945 1950

Glu Trp Pro Thr Ala Thr Gly Asp Val Val Leu Ala Thr Asp Asp Leu  
1955 1960 1965

Tyr Val Lys Arg Tyr Glu Arg Gly Cys Ile Thr Phe Gly Lys Pro Val  
1970 1975 1980

Ile Trp Leu Ser His Glu Gln Ala Ser Leu Asn Ser Leu Thr Tyr Phe  
1985 1990 1995 2000

Asn Arg Pro Leu Leu Val Asp Glu Asn Lys Phe Asp Val Leu Lys Val  
2005 2010 2015

Asp Asp Val Asp Asp Gly Gly Asp Ile Ser Glu Ser Asp Ala Lys Glu  
2020 2025 2030

Ser Lys Glu Ile Asn Ile Ile Lys Leu Ser Gly Val Lys Lys Pro Phe  
2035 2040 2045

Lys Val Glu Asp Ser Val Ile Val Asn Asp Asp Thr Ser Glu Ile Lys  
2050 2055 2060

Tyr Val Lys Ser Leu Ser Ile Val Asp Val Tyr Asp Met Trp Leu Thr  
2065 2070 2075 2080

Gly Cys Arg Tyr Val Val Arg Thr Ala Asn Ala Leu Ser Met Ala Val  
2085 2090 2095

Asn Val Pro Thr Ile Arg Lys Phe Ile Lys Phe Gly Met Thr Leu Val  
2100 2105 2110

Ser Ile Pro Ile Asp Leu Leu Asn Leu Arg Glu Ile Lys Pro Val Phe  
2115 2120 2125

Asn Val Val Lys Ala Val Arg Asn Lys Ile Ser Ala Cys Phe Asn Phe  
2130 2135 2140



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Ile Lys Trp Leu Phe Val Leu Leu Phe Gly Trp Ile Lys Ile Ser Ala  
2145 2150 2155 2160

Asp Asn Lys Val Ile Tyr Thr Thr Glu Val Ala Ser Lys Leu Thr Cys  
2165 2170 2175

Lys Leu Val Ala Leu Ala Phe Lys Asn Ala Phe Leu Thr Phe Lys Trp  
2180 2185 2190

Ser Val Val Ala Arg Gly Ala Cys Ile Ile Ala Thr Ile Phe Leu Leu  
2195 2200 2205

Trp Phe Asn Phe Ile Tyr Ala Asn Val Ile Phe Ser Asp Phe Tyr Leu  
2210 2215 2220

Pro Lys Ile Gly Phe Leu Pro Thr Phe Val Gly Lys Ile Ala Gln Trp  
2225 2230 2235 2240

Ile Lys Ser Thr Phe Ser Leu Val Thr Ile Cys Asp Leu Tyr Ser Ile  
2245 2250 2255

Gln Asp Val Gly Phe Lys Asn Gln Tyr Cys Asn Gly Ser Ile Ala Cys  
2260 2265 2270

Gln Phe Cys Leu Ala Gly Phe Asp Met Leu Asp Asn Tyr Lys Ala Ile  
2275 2280 2285

Asp Val Val Gln Tyr Glu Ala Asp Arg Arg Ala Phe Val Asp Tyr Thr  
2290 2295 2300

Gly Val Leu Lys Ile Val Ile Glu Leu Ile Val Ser Tyr Ala Leu Tyr  
2305 2310 2315 2320

Thr Ala Trp Phe Tyr Pro Leu Phe Ala Leu Ile Ser Ile Gln Ile Leu  
2325 2330 2335

Thr Thr Trp Leu Pro Glu Leu Phe Met Leu Ser Thr Leu His Trp Ser  
2340 2345 2350

Val Arg Leu Leu Val Ser Leu Ala Asn Met Leu Pro Ala His Val Phe  
2355 2360 2365

Met Arg Phe Tyr Ile Ile Ile Ala Ser Phe Ile Lys Leu Phe Ile Leu  
2370 2375 2380

Phe Arg His Val Ala Tyr Gly Cys Ser Lys Pro Gly Cys Leu Phe Cys  
2385 2390 2395 2400

Tyr Lys Arg Asn Arg Ser Leu Arg Val Lys Cys Ser Thr Ile Val Gly  
2405 2410 2415

Gly Met Ile Arg Tyr Tyr Asp Val Met Ala Asn Gly Gly Thr Gly Phe  
2420 2425 2430

Cys Ser Lys His Gln Trp Asn Cys Ile Asp Cys Asp Ser Tyr Lys Pro  
2435 2440 2445

Gly Asn Thr Phe Ile Thr Val Glu Ala Ala Leu Asp Leu Ser Lys Glu  
2450 2455 2460

Leu Lys Arg Pro Ile Gln Pro Thr Asp Val Ala Tyr His Thr Val Thr  
2465 2470 2475 2480

SEQLIST-20480.TXT

Asp Val Lys Gln Val Gly Cys Tyr Met Arg Leu Phe Tyr Glu Arg Asp  
2485 2490 2495

Gly Gln Arg Thr Tyr Asp Asp Val Asn Ala Ser Leu Phe Val Asp Tyr  
2500 2505 2510

Ser Asn Leu Leu His Ser Lys Val Lys Gly Val Pro Asn Met His Val  
2515 2520 2525

Val Val Val Glu Asn Asp Ala Asp Lys Ala Asn Phe Leu Asn Ala Ala  
2530 2535 2540

Val Phe Tyr Ala Gln Ser Leu Phe Arg Pro Ile Leu Met Val Asp Lys  
2545 2550 2555 2560

Asn Leu Ile Thr Thr Ala Asn Thr Gly Thr Ser Val Thr Glu Thr Met  
2565 2570 2575

Phe Asp Val Tyr Val Asp Thr Phe Leu Ser Met Phe Asp Val Asp Lys  
2580 2585 2590

Lys Ser Leu Asn Ala Leu Ile Ala Thr Ala His Ser Ser Ile Lys Gln  
2595 2600 2605

Gly Thr Gln Ile Cys Lys Val Leu Asp Thr Phe Leu Ser Cys Ala Arg  
2610 2615 2620

Lys Ser Cys Ser Ile Asp Ser Asp Val Asp Thr Lys Cys Leu Ala Asp  
2625 2630 2635 2640

Ser Val Met Ser Ala Val Ser Ala Gly Leu Glu Leu Thr Asp Glu Ser  
2645 2650 2655

Cys Asn Asn Leu Val Pro Thr Tyr Leu Lys Gly Asp Asn Ile Val Ala  
2660 2665 2670

Ala Asp Leu Gly Val Leu Ile Gln Asn Ser Ala Lys His Val Gln Gly  
2675 2680 2685

Asn Val Ala Lys Ile Ala Gly Val Ser Cys Ile Trp Ser Val Asp Ala  
2690 2695 2700

Phe Asn Gln Leu Ser Ser Asp Phe Gln His Lys Leu Lys Lys Ala Cys  
2705 2710 2715 2720

Cys Lys Thr Gly Leu Lys Leu Lys Leu Thr Tyr Asn Lys Gln Met Ala  
2725 2730 2735

Asn Val Ser Val Leu Thr Thr Pro Phe Ser Leu Lys Gly Gly Ala Val  
2740 2745 2750

Phe Ser Tyr Phe Val Tyr Val Cys Phe Leu Leu Ser Leu Val Cys Phe  
2755 2760 2765

Ile Gly Leu Trp Cys Leu Met Pro Thr Tyr Thr Val His Lys Ser Asp  
2770 2775 2780

Phe Gln Leu Pro Val Tyr Ala Ser Tyr Lys Val Leu Asp Asn Gly Val  
2785 2790 2795 2800

Ile Arg Asp Val Ser Val Glu Asp Val Cys Phe Ala Asn Lys Phe Glu  
2805 2810 2815

SEQLIST-20480.TXT

Gln Phe Asp Gln Trp Tyr Glu Ser Thr Phe Gly Leu Ser Tyr Tyr Ser  
2820 2825 2830

Asn Ser Met Ala Cys Pro Ile Val Val Ala Val Val Asp Gln Asp Leu  
2835 2840 2845

Gly Ser Thr Val Phe Asn Val Pro Thr Lys Val Leu Arg Tyr Gly Tyr  
2850 2855 2860

His Val Leu His Phe Ile Thr His Ala Leu Ser Ala Asp Gly Val Gln  
2865 2870 2875 2880

Cys Tyr Thr Pro His Ser Gln Ile Ser Tyr Ser Asn Phe Tyr Ala Ser  
2885 2890 2895

Gly Cys Val Leu Ser Ser Ala Cys Thr Met Phe Ala Met Ala Asp Gly  
2900 2905 2910

Ser Pro Gln Pro Tyr Cys Tyr Thr Glu Gly Leu Met Gln Asn Ala Ser  
2915 2920 2925

Leu Tyr Ser Ser Leu Val Pro His Val Arg Tyr Asn Leu Ala Asn Ala  
2930 2935 2940

Lys Gly Phe Ile Arg Phe Pro Glu Val Leu Arg Glu Gly Leu Val Arg  
2945 2950 2955 2960

Ile Val Arg Thr Arg Ser Met Ser Tyr Cys Arg Val Gly Leu Cys Glu  
2965 2970 2975

Glu Ala Asp Glu Gly Ile Cys Phe Asn Phe Asn Gly Ser Trp Val Leu  
2980 2985 2990

Asn Asn Asp Tyr Tyr Arg Ser Leu Pro Gly Thr Phe Cys Gly Arg Asp  
2995 3000 3005

Val Phe Asp Leu Ile Tyr Gln Leu Phe Lys Gly Leu Ala Gln Pro Val  
3010 3015 3020

Asp Phe Leu Ala Leu Thr Ala Ser Ser Ile Ala Gly Ala Ile Leu Ala  
3025 3030 3035 3040

Val Ile Val Val Leu Val Phe Tyr Tyr Leu Ile Lys Leu Lys Arg Ala  
3045 3050 3055

Phe Gly Asp Tyr Thr Ser Ile Val Phe Val Asn Val Ile Val Trp Cys  
3060 3065 3070

Val Asn Phe Met Met Leu Phe Val Phe Gln Val Tyr Pro Thr Leu Ser  
3075 3080 3085

Cys Val Tyr Ala Ile Cys Tyr Phe Tyr Ala Thr Leu Tyr Phe Pro Ser  
3090 3095 3100

Glu Ile Ser Val Ile Met His Leu Gln Trp Leu Val Met Tyr Gly Thr  
3105 3110 3115 3120

Ile Met Pro Leu Trp Phe Cys Leu Leu Tyr Ile Ser Val Val Val Ser  
3125 3130 3135

Asn His Ala Phe Trp Val Phe Ala Tyr Cys Arg Arg Leu Gly Thr Ser  
3140 3145 3150

SEQLIST-20480.TXT

Val Arg Ser Asp Gly Thr Phe Glu Glu Met Ala Leu Thr Thr Phe Met  
3155 3160 3165

Ile Thr Lys Asp Ser Tyr Cys Lys Leu Lys Asn Ser Leu Ser Asp Val  
3170 3175 3180

Ala Phe Asn Arg Tyr Leu Ser Leu Tyr Asn Lys Tyr Arg Tyr Tyr Ser  
3185 3190 3195 3200

Gly Lys Met Asp Thr Ala Ala Tyr Arg Glu Ala Ala Cys Ser Gln Leu  
3205 3210 3215

Ala Lys Ala Met Asp Thr Phe Thr Asn Asn Asn Gly Ser Asp Val Leu  
3220 3225 3230

Tyr Gln Pro Pro Thr Ala Ser Val Ser Thr Ser Phe Leu Gln Ser Gly  
3235 3240 3245

Ile Val Lys Met Val Asn Pro Thr Ser Lys Val Glu Pro Cys Ile Val  
3250 3255 3260

Ser Val Thr Tyr Gly Asn Met Thr Leu Asn Gly Leu Trp Leu Asp Asp  
3265 3270 3275 3280

Lys Val Tyr Cys Pro Arg His Val Ile Cys Ser Ala Ser Asp Met Thr  
3285 3290 3295

Asn Pro Asp Tyr Thr Asn Leu Leu Cys Arg Val Thr Ser Ser Asp Phe  
3300 3305 3310

Thr Val Leu Phe Asp Arg Leu Ser Leu Thr Val Met Ser Tyr Gln Met  
3315 3320 3325

Gln Gly Cys Met Leu Val Leu Thr Val Thr Leu Gln Asn Ser Arg Thr  
3330 3335 3340

Pro Lys Tyr Thr Phe Gly Val Val Lys Pro Gly Glu Thr Phe Thr Val  
3345 3350 3355 3360

Leu Ala Ala Tyr Asn Gly Lys Pro Gln Gly Ala Phe His Val Thr Met  
3365 3370 3375

Arg Ser Ser Tyr Thr Ile Lys Gly Ser Phe Leu Cys Gly Ser Cys Gly  
3380 3385 3390

Ser Val Gly Tyr Val Leu Met Gly Asp Cys Val Lys Phe Val Tyr Met  
3395 3400 3405

His Gln Leu Glu Leu Ser Thr Gly Cys His Thr Gly Thr Asp Phe Asn  
3410 3415 3420

Gly Asp Phe Tyr Gly Pro Tyr Lys Asp Ala Gln Val Val Gln Leu Pro  
3425 3430 3435 3440

Val Gln Asp Tyr Ile Gln Ser Val Asn Phe Val Ala Trp Leu Tyr Ala  
3445 3450 3455

Ala Ile Leu Asn Asn Cys Asn Trp Phe Val Gln Ser Asp Lys Cys Ser  
3460 3465 3470

Val Glu Asp Phe Asn Val Trp Ala Leu Ser Asn Gly Phe Ser Gln Val  
3475 3480 3485

SEQLIST-20480.TXT

Lys Ser Asp Leu Val Ile Asp Ala Leu Ala Ser Met Thr Gly Val Ser  
 3490 3495 3500  
 Leu Glu Thr Leu Leu Ala Ala Ile Lys Arg Leu Lys Asn Gly Phe Gln  
 3505 3510 3515 3520  
 Gly Arg Gln Ile Met Gly Ser Cys Ser Phe Glu Asp Glu Leu Thr Pro  
 3525 3530 3535  
 Ser Asp Val Tyr Gln Gln Leu Ala Gly Ile Lys Leu Gln Ser Lys Arg  
 3540 3545 3550  
 Thr Arg Leu Val Lys Gly Ile Val Cys Trp Ile Met Ala Ser Thr Phe  
 3555 3560 3565  
 Leu Phe Ser Cys Ile Ile Thr Ala Phe Val Lys Trp Thr Met Phe Met  
 3570 3575 3580  
 Tyr Val Thr Thr Asn Met Leu Ser Ile Thr Phe Cys Ala Leu Cys Val  
 3585 3590 3595 3600  
 Ile Ser Leu Ala Met Leu Leu Val Lys His Lys His Leu Tyr Leu Thr  
 3605 3610 3615  
 Met Tyr Ile Ile Pro Val Leu Phe Thr Leu Leu Tyr Asn Asn Tyr Leu  
 3620 3625 3630  
 Val Val Tyr Lys Gln Thr Phe Arg Gly Tyr Val Tyr Ala Trp Leu Ser  
 3635 3640 3645  
 Tyr Tyr Val Pro Ser Val Glu Tyr Thr Tyr Thr Asp Glu Val Ile Tyr  
 3650 3655 3660  
 Gly Met Leu Leu Leu Ile Gly Met Val Phe Val Thr Leu Arg Ser Ile  
 3665 3670 3675 3680  
 Asn His Asp Leu Phe Ser Phe Ile Met Phe Val Gly Arg Val Ile Ser  
 3685 3690 3695  
 Val Val Ser Leu Trp Tyr Met Gly Ser Asn Leu Glu Glu Glu Ile Leu  
 3700 3705 3710  
 Leu Met Leu Ala Ser Leu Phe Gly Thr Tyr Thr Trp Thr Thr Ala Leu  
 3715 3720 3725  
 Ser Met Ala Ala Ala Lys Val Ile Ala Lys Trp Val Ala Val Asn Val  
 3730 3735 3740  
 Leu Tyr Phe Thr Asp Ile Pro Gln Ile Lys Ile Val Leu Val Cys Tyr  
 3745 3750 3755 3760  
 Leu Phe Ile Gly Tyr Ile Ile Ser Cys Tyr Trp Gly Leu Phe Ser Leu  
 3765 3770 3775  
 Met Asn Ser Leu Phe Arg Met Pro Leu Gly Val Tyr Asn Tyr Lys Ile  
 3780 3785 3790  
 Ser Val Gln Glu Leu Arg Tyr Met Asn Ala Asn Gly Leu Arg Pro Pro  
 3795 3800 3805  
 Lys Asn Ser Phe Glu Ala Leu Met Leu Asn Phe Lys Leu Leu Gly Ile  
 3810 3815 3820

SEQLIST-20480.TXT

Gly Gly Val Pro Ile Ile Glu Val Ser Gln Phe Gln Ser Lys Leu Thr  
3825 3830 3835 3840

Asp Val Lys Cys Ala Asn Val Val Leu Leu Asn Cys Leu Gln His Leu  
3845 3850 3855

His Val Ala Ser Asn Ser Lys Leu Trp Gln Tyr Cys Ser Thr Leu His  
3860 3865 3870

Asn Glu Ile Leu Ala Thr Ser Asp Leu Gly Val Ala Phe Glu Lys Leu  
3875 3880 3885

Ala Gln Leu Leu Ile Val Leu Phe Ala Asn Pro Ala Ala Val Asp Ser  
3890 3895 3900

Lys Cys Leu Thr Ser Ile Glu Glu Val Cys Asp Asp Tyr Ala Lys Asp  
3905 3910 3915 3920

Asn Thr Val Leu Gln Ala Leu Gln Ser Glu Phe Val Asn Met Ala Ser  
3925 3930 3935

Phe Val Glu Tyr Glu Val Ala Lys Lys Asn Leu Asp Glu Ala Arg Ser  
3940 3945 3950

Ser Gly Ser Ala Asn Gln Gln Gln Leu Lys Gln Leu Glu Lys Ala Cys  
3955 3960 3965

Asn Ile Ala Lys Ser Ala Tyr Glu Arg Asp Arg Ala Val Ala Arg Lys  
3970 3975 3980

Leu Glu Arg Met Ala Asp Leu Ala Leu Thr Asn Met Tyr Lys Glu Ala  
3985 3990 3995 4000

Arg Ile Asn Asp Lys Lys Ser Lys Val Val Ser Ala Leu Gln Thr Met  
4005 4010 4015

Leu Phe Ser Met Val Arg Lys Leu Asp Asn Gln Ala Leu Asn Ser Ile  
4020 4025 4030

Leu Asp Asn Ala Val Lys Gly Cys Val Pro Leu Asn Ala Ile Pro Ser  
4035 4040 4045

Leu Ala Ala Asn Thr Leu Thr Ile Ile Val Pro Asp Lys Ser Val Tyr  
4050 4055 4060

Asp Gln Val Val Asp Asn Val Tyr Val Thr Tyr Ala Gly Asn Val Trp  
4065 4070 4075 4080

Gln Ile Gln Thr Ile Gln Asp Ser Asp Gly Thr Asn Lys Gln Leu Asn  
4085 4090 4095

Glu Ile Ser Asp Asp Cys Asn Trp Pro Leu Val Ile Ile Ala Asn Arg  
4100 4105 4110

His Asn Glu Val Ser Ala Thr Val Leu Gln Asn Asn Glu Leu Met Pro  
4115 4120 4125

Ala Lys Leu Lys Thr Gln Val Val Asn Ser Gly Pro Asp Gln Thr Cys  
4130 4135 4140

Asn Thr Pro Thr Gln Cys Tyr Tyr Asn Asn Ser Asn Asn Gly Lys Ile  
4145 4150 4155 4160

SEQLIST-20480.TXT

Val Tyr Ala Ile Leu Ser Asp Val Asp Gly Leu Lys Tyr Thr Lys Ile  
4165 4170 4175

Leu Lys Asp Asp Gly Asn Phe Val Val Leu Glu Leu Asp Pro Pro Cys  
4180 4185 4190

Lys Phe Thr Val Gln Asp Val Lys Gly Leu Lys Ile Lys Tyr Leu Tyr  
4195 4200 4205

Phe Val Lys Gly Cys Asn Thr Leu Ala Arg Gly Trp Val Val Gly Thr  
4210 4215 4220

Ile Ser Ser Thr Val Arg Leu Gln Ala Gly Thr Ala Thr Glu Tyr Ala  
4225 4230 4235 4240

Ser Asn Ser Ser Ile Leu Ser Leu Cys Ala Phe Ser Val Asp Pro Lys  
4245 4250 4255

Lys Thr Tyr Leu Asp Phe Ile Gln Gln Gly Gly Thr Pro Ile Ala Asn  
4260 4265 4270

Cys Val Lys Met Leu Cys Asp His Ala Gly Thr Gly Met Ala Ile Thr  
4275 4280 4285

Val Lys Pro Asp Ala Thr Thr Asn Gln Asp Ser Tyr Gly Gly Ala Ser  
4290 4295 4300

Val Cys Ile Tyr Cys Arg Ala Arg Val Glu His Pro Asp Val Asp Gly  
4305 4310 4315 4320

Leu Cys Lys Leu Arg Gly Lys Phe Val Gln Val Pro Val Gly Ile Lys  
4325 4330 4335

Asp Pro Val Ser Tyr Val Leu Thr His Asp Val Cys Gln Val Cys Gly  
4340 4345 4350

Phe Trp Arg Asp Gly Ser Cys Ser Cys Val Ser Thr Asp Thr Thr Val  
4355 4360 4365

Gln Ser Lys Asp Thr Asn Phe Leu Asn Arg Val Arg Gly Thr Ser Val  
4370 4375 4380

Asp Ala Arg Leu Val Pro Cys Ala Ser Gly Leu Ser Thr Asp Val Gln  
4385 4390 4395 4400

Leu Arg Ala Phe Asp Ile Cys Asn Ala Ser Val Ala Gly Ile Gly Leu  
4405 4410 4415

His Leu Lys Val Asn Cys Cys Arg Phe Gln Arg Val Asp Glu Asn Gly  
4420 4425 4430

Asp Lys Leu Asp Gln Phe Phe Val Val Lys Arg Thr Asp Leu Thr Ile  
4435 4440 4445

Tyr Asn Arg Glu Met Glu Cys Tyr Glu Arg Val Lys Asp Cys Lys Phe  
4450 4455 4460

Val Ala Glu His Asp Phe Phe Thr Phe Asp Val Glu Gly Ser Arg Val  
4465 4470 4475 4480

Pro His Ile Val Arg Lys Asp Leu Thr Lys Tyr Thr Met Leu Asp Leu  
4485 4490 4495

SEQLIST-20480.TXT

Cys Tyr Ala Leu Arg His Phe Asp Arg Asn Asp Cys Met Leu Leu Cys  
4500 4505 4510

Asp Ile Leu Ser Ile Tyr Ala Gly Cys Glu Gln Ser Tyr Phe Thr Lys  
4515 4520 4525

Lys Asp Trp Tyr Asp Phe Val Glu Asn Pro Asp Ile Ile Asn Val Tyr  
4530 4535 4540

Lys Lys Leu Gly Pro Ile Phe Asn Arg Ala Leu Val Ser Ala Thr Glu  
4545 4550 4555 4560

Phe Ala Asp Lys Leu Val Glu Val Gly Leu Val Gly Ile Leu Thr Leu  
4565 4570 4575

Asp Asn Gln Asp Leu Asn Gly Lys Trp Tyr Asp Phe Gly Asp Tyr Val  
4580 4585 4590

Ile Ala Ala Pro Gly Cys Gly Val Ala Ile Ala Asp Ser Tyr Tyr Ser  
4595 4600 4605

Tyr Met Met Pro Met Leu Thr Met Cys His Ala Leu Asp Cys Glu Leu  
4610 4615 4620

Tyr Val Asn Asn Ala Tyr Arg Leu Phe Asp Leu Val Gln Tyr Asp Phe  
4625 4630 4635 4640

Thr Asp Tyr Lys Leu Glu Leu Phe Asn Lys Tyr Phe Lys His Trp Ser  
4645 4650 4655

Met Pro Tyr His Pro Asn Thr Val Asp Cys Gln Asp Asp Arg Cys Ile  
4660 4665 4670

Ile His Cys Ala Asn Phe Asn Ile Leu Phe Ser Met Val Leu Pro Asn  
4675 4680 4685

Thr Cys Phe Gly Pro Leu Val Arg Gln Ile Phe Val Asp Gly Val Pro  
4690 4695 4700

Phe Val Val Ser Ile Gly Tyr His Tyr Lys Glu Leu Gly Ile Val Met  
4705 4710 4715 4720

Asn Met Asp Val Asp Thr His Arg Tyr Arg Leu Ser Leu Lys Asp Leu  
4725 4730 4735

Leu Leu Tyr Ala Ala Asp Pro Ala Leu His Val Ala Ser Ala Ser Ala  
4740 4745 4750

Leu Tyr Asp Leu Arg Thr Cys Cys Phe Ser Val Ala Ala Ile Thr Ser  
4755 4760 4765

Gly Val Lys Phe Gln Thr Val Lys Pro Gly Asn Phe Asn Gln Asp Phe  
4770 4775 4780

Tyr Asp Phe Ile Leu Ser Lys Gly Leu Leu Lys Glu Gly Ser Ser Val  
4785 4790 4795 4800

Asp Leu Lys His Phe Phe Phe Thr Gln Asp Gly Asn Ala Ala Ile Thr  
4805 4810 4815

Asp Tyr Asn Tyr Tyr Lys Tyr Asn Leu Pro Thr Met Val Asp Ile Lys  
4820 4825 4830



SEQLIST-20480.TXT

Gln Leu Leu Phe Val Leu Glu Val Val Tyr Lys Tyr Phe Glu Ile Tyr  
4835 4840 4845

Asp Gly Gly Cys Ile Pro Ala Ser Gln Val Ile Val Asn Asn Tyr Asp  
4850 4855 4860

Lys Ser Ala Gly Tyr Pro Phe Asn Lys Phe Gly Lys Ala Arg Leu Tyr  
4865 4870 4875 4880

Tyr Glu Ala Leu Ser Phe Glu Glu Gln Asp Glu Ile Tyr Ala Tyr Thr  
4885 4890 4895

Lys Arg Asn Val Leu Pro Thr Leu Thr Gln Met Asn Leu Lys Tyr Ala  
4900 4905 4910

Ile Ser Ala Lys Asn Arg Ala Arg Thr Val Ala Gly Val Ser Ile Leu  
4915 4920 4925

Ser Thr Met Thr Gly Arg Met Phe His Gln Lys Cys Leu Lys Ser Ile  
4930 4935 4940

Ala Ala Thr Arg Gly Val Pro Val Val Ile Gly Thr Thr Lys Phe Tyr  
4945 4950 4955 4960

Gly Gly Trp Asp Asp Met Leu Arg Arg Leu Ile Lys Asp Val Asp Asn  
4965 4970 4975

Pro Val Leu Met Gly Trp Asp Tyr Pro Lys Cys Asp Arg Ala Met Pro  
4980 4985 4990

Asn Ile Leu Arg Ile Val Ser Ser Leu Val Leu Ala Arg Lys His Glu  
4995 5000 5005

Ala Cys Cys Ser Gln Ser Asp Arg Phe Tyr Arg Leu Ala Asn Glu Cys  
5010 5015 5020

Ala Gln Val Leu Ser Glu Ile Val Met Cys Gly Gly Cys Tyr Tyr Val  
5025 5030 5035 5040

Lys Pro Gly Gly Thr Ser Ser Gly Asp Ala Thr Thr Ala Phe Ala Asn  
5045 5050 5055

Ser Val Phe Asn Ile Cys Gln Ala Val Ser Ala Asn Val Cys Ala Leu  
5060 5065 5070

Met Ser Cys Asn Gly Asn Lys Ile Glu Asp Leu Ser Ile Arg Ala Leu  
5075 5080 5085

Gln Lys Arg Leu Tyr Ser His Val Tyr Arg Ser Asp Met Val Asp Ser  
5090 5095 5100

Thr Phe Val Thr Glu Tyr Tyr Glu Phe Leu Asn Lys His Phe Ser Met  
5105 5110 5115 5120

Met Ile Leu Ser Asp Asp Gly Val Val Cys Tyr Asn Ser Asp Tyr Ala  
5125 5130 5135

Ser Lys Gly Tyr Ile Ala Asn Ile Ser Ala Phe Gln Gln Val Leu Tyr  
5140 5145 5150

Tyr Gln Asn Asn Val Phe Met Ser Glu Ser Lys Cys Trp Val Glu Asn  
5155 5160 5165

SEQLIST-20480.TXT

Asp Ile Asn Asn Gly Pro His Glu Phe Cys Ser Gln His Thr Met Leu  
 5170 5175 5180  
 Val Lys Met Asp Gly Asp Asp Val Tyr Leu Pro Tyr Pro Asp Pro Ser  
 5185 5190 5195 5200  
 Arg Ile Leu Gly Ala Gly Cys Phe Val Asp Asp Leu Leu Lys Thr Asp  
 5205 5210 5215  
 Ser Val Leu Leu Ile Glu Arg Phe Val Ser Leu Ala Ile Asp Ala Tyr  
 5220 5225 5230  
 Pro Leu Val Tyr His Glu Asn Glu Glu Tyr Gln Lys Val Phe Arg Val  
 5235 5240 5245  
 Tyr Leu Glu Tyr Ile Lys Lys Leu Tyr Asn Asp Leu Gly Asn Gln Ile  
 5250 5255 5260  
 Leu Asp Ser Tyr Ser Val Ile Leu Ser Thr Cys Asp Gly Gln Lys Phe  
 5265 5270 5275 5280  
 Thr Asp Glu Ser Phe Tyr Lys Asn Met Tyr Leu Arg Ser Ala Val Met  
 5285 5290 5295  
 Gln Ser Val Gly Ala Cys Val Val Cys Ser Ser Gln Thr Ser Leu Arg  
 5300 5305 5310  
 Cys Gly Ser Cys Ile Arg Lys Pro Leu Leu Cys Cys Lys Cys Cys Tyr  
 5315 5320 5325  
 Asp His Val Met Ala Thr Asp His Lys Tyr Val Leu Ser Val Ser Pro  
 5330 5335 5340  
 Tyr Val Cys Asn Ala Pro Gly Cys Asp Val Asn Asp Val Thr Lys Leu  
 5345 5350 5355 5360  
 Tyr Leu Gly Gly Met Ser Tyr Tyr Cys Glu Asp His Lys Pro Gln Tyr  
 5365 5370 5375  
 Ser Phe Lys Leu Val Met Asn Gly Met Val Phe Gly Leu Tyr Lys Gln  
 5380 5385 5390  
 Ser Cys Thr Gly Ser Pro Tyr Ile Asp Asp Phe Asn Arg Ile Ala Ser  
 5395 5400 5405  
 Cys Lys Trp Thr Asp Val Asp Asp Tyr Ile Leu Ala Asn Glu Cys Thr  
 5410 5415 5420  
 Glu Arg Leu Lys Leu Phe Ala Ala Glu Thr Gln Lys Ala Thr Glu Glu  
 5425 5430 5435 5440  
 Ala Phe Lys Gln Ser Tyr Ala Ser Ala Thr Ile Gln Glu Ile Val Ser  
 5445 5450 5455  
 Glu Arg Glu Leu Ile Leu Ser Trp Glu Ile Gly Lys Val Lys Pro Pro  
 5460 5465 5470  
 Leu Asn Lys Asn Tyr Val Phe Thr Gly Tyr His Phe Thr Lys Asn Gly  
 5475 5480 5485  
 Lys Thr Val Leu Gly Glu Tyr Val Phe Asp Lys Ser Glu Leu Thr Asn  
 5490 5495 5500

SEQLIST-20480.TXT

Gly Val Tyr Tyr Arg Ala Thr Thr Thr Tyr Lys Leu Ser Val Gly Asp  
5505 5510 5515 5520

Val Phe Val Leu Thr Ser His Ser Val Ala Asn Leu Ser Ala Pro Thr  
5525 5530 5535

Leu Val Pro Gln Glu Asn Tyr Ser Ser Ile Arg Phe Ala Ser Val Tyr  
5540 5545 5550

Ser Val Leu Glu Thr Phe Gln Asn Asn Val Val Asn Tyr Gln His Ile  
5555 5560 5565

Gly Met Lys Arg Tyr Cys Thr Val Gln Gly Pro Pro Gly Thr Gly Lys  
5570 5575 5580

Ser His Leu Ala Ile Gly Leu Ala Val Tyr Tyr Cys Thr Ala Arg Val  
5585 5590 5595 5600

Val Tyr Thr Ala Ala Ser His Ala Ala Val Asp Ala Leu Cys Glu Lys  
5605 5610 5615

Ala Tyr Lys Phe Leu Asn Ile Asn Asp Cys Thr Arg Ile Val Pro Ala  
5620 5625 5630

Lys Val Arg Val Glu Cys Tyr Asp Lys Phe Lys Ile Asn Asp Thr Thr  
5635 5640 5645

Arg Lys Tyr Val Phe Thr Thr Ile Asn Ala Leu Pro Glu Met Val Thr  
5650 5655 5660

Asp Ile Val Val Val Asp Glu Val Ser Met Leu Thr Asn Tyr Glu Leu  
5665 5670 5675 5680

Ser Val Ile Asn Ala Arg Ile Arg Ala Lys His Tyr Val Tyr Ile Gly  
5685 5690 5695

Asp Pro Ala Gln Leu Pro Ala Pro Arg Val Leu Leu Ser Lys Gly Thr  
5700 5705 5710

Leu Glu Pro Lys Tyr Phe Asn Thr Val Thr Lys Leu Met Cys Cys Leu  
5715 5720 5725

Gly Pro Asp Ile Phe Leu Gly Thr Cys Tyr Arg Cys Pro Lys Glu Ile  
5730 5735 5740

Val Asp Thr Val Ser Ala Leu Val Tyr Glu Asn Lys Leu Lys Ala Lys  
5745 5750 5755 5760

Asn Glu Ser Ser Ser Leu Cys Phe Lys Val Tyr Tyr Lys Gly Val Thr  
5765 5770 5775

Thr His Glu Ser Ser Ser Ala Val Asn Met Gln Gln Ile Tyr Leu Ile  
5780 5785 5790

Asn Lys Phe Leu Lys Ala Asn Pro Leu Trp His Lys Ala Val Phe Ile  
5795 5800 5805

Ser Pro Tyr Asn Ser Gln Asn Phe Ala Ala Lys Arg Val Leu Gly Leu  
5810 5815 5820

Gln Thr Gln Thr Val Asp Ser Ala Gln Gly Ser Glu Tyr Asp Tyr Val  
5825 5830 5835 5840

SEQLIST-20480.TXT

Ile Tyr Ser Gln Thr Ala Glu Thr Ala His Ser Val Asn Val Asn Arg  
5845 5850 5855

Phe Asn Val Ala Ile Thr Arg Ala Lys Lys Gly Ile Leu Cys Val Met  
5860 5865 5870

Ser Asn Met Gln Leu Phe Glu Ala Leu Gln Phe Thr Thr Leu Thr Leu  
5875 5880 5885

Asp Lys Val Pro Gln Ala Val Glu Thr Arg Val Gln Cys Ser Thr Asn  
5890 5895 5900

Leu Phe Lys Asp Cys Ser Lys Ser Tyr Ser Gly Tyr His Pro Ala His  
5905 5910 5915 5920

Ala Pro Ser Phe Leu Ala Val Asp Asp Lys Tyr Lys Ala Thr Gly Asp  
5925 5930 5935

Leu Ala Val Cys Leu Gly Ile Gly Asp Ser Ala Val Thr Tyr Ser Arg  
5940 5945 5950

Leu Ile Ser Leu Met Gly Phe Lys Leu Asp Val Thr Leu Asp Gly Tyr  
5955 5960 5965

Cys Lys Leu Phe Ile Thr Lys Glu Glu Ala Val Lys Arg Val Arg Ala  
5970 5975 5980

Trp Val Gly Phe Asp Ala Glu Gly Ala His Ala Thr Arg Asp Ser Ile  
5985 5990 5995 6000

Gly Thr Asn Phe Pro Leu Gln Leu Gly Phe Ser Thr Gly Ile Asp Phe  
6005 6010 6015

Val Val Glu Ala Thr Gly Leu Phe Ala Asp Arg Asp Gly Tyr Ser Phe  
6020 6025 6030

Lys Lys Ala Val Ala Lys Ala Pro Pro Gly Glu Gln Phe Lys His Leu  
6035 6040 6045

Ile Pro Leu Met Thr Arg Gly Gln Arg Trp Asp Val Val Arg Pro Arg  
6050 6055 6060

Ile Val Gln Met Phe Ala Asp His Leu Ile Asp Leu Ser Asp Cys Val  
6065 6070 6075 6080

Val Leu Val Thr Trp Ala Ala Asn Phe Glu Leu Thr Cys Leu Arg Tyr  
6085 6090 6095

Phe Ala Lys Val Gly Arg Glu Ile Ser Cys Asn Val Cys Thr Lys Arg  
6100 6105 6110

Ala Thr Ala Tyr Asn Ser Arg Thr Gly Tyr Tyr Gly Cys Trp Arg His  
6115 6120 6125

Ser Val Thr Cys Asp Tyr Leu Tyr Asn Pro Leu Ile Val Asp Ile Gln  
6130 6135 6140

Gln Trp Gly Tyr Ile Gly Ser Leu Ser Ser Asn His Asp Leu Tyr Cys  
6145 6150 6155 6160

Ser Val His Lys Gly Ala His Val Ala Ser Ser Asp Ala Ile Met Thr  
6165 6170 6175

SEQLIST-20480.TXT

Arg Cys Leu Ala Val Tyr Asp Cys Phe Cys Asn Asn Ile Asn Trp Asn  
6180 6185 6190

Val Glu Tyr Pro Ile Ile Ser Asn Glu Leu Ser Ile Asn Thr Ser Cys  
6195 6200 6205

Arg Val Leu Gln Arg Val Met Leu Lys Ala Ala Met Leu Cys Asn Arg  
6210 6215 6220

Tyr Thr Leu Cys Tyr Asp Ile Gly Asn Pro Lys Ala Ile Ala Cys Val  
6225 6230 6235 6240

Lys Asp Phe Asp Phe Lys Phe Tyr Asp Ala Gln Pro Ile Val Lys Ser  
6245 6250 6255

Val Lys Thr Leu Leu Tyr Ser Phe Glu Ala His Lys Asp Ser Phe Lys  
6260 6265 6270

Asp Gly Leu Cys Met Phe Trp Asn Cys Asn Val Asp Lys Tyr Pro Pro  
6275 6280 6285

Asn Ala Val Val Cys Arg Phe Asp Thr Arg Val Leu Asn Asn Leu Asn  
6290 6295 6300

Leu Pro Gly Cys Asn Gly Gly Ser Leu Tyr Val Asn Lys His Ala Phe  
6305 6310 6315 6320

His Thr Lys Pro Phe Ser Arg Ala Ala Phe Glu His Leu Lys Pro Met  
6325 6330 6335

Pro Phe Phe Tyr Tyr Ser Asp Thr Pro Cys Val Tyr Met Asp Gly Met  
6340 6345 6350

Asp Ala Lys Gln Val Asp Tyr Val Pro Leu Lys Ser Ala Thr Cys Ile  
6355 6360 6365

Thr Arg Cys Asn Leu Gly Gly Ala Val Cys Leu Lys His Ala Glu Glu  
6370 6375 6380

Tyr Arg Glu Tyr Leu Glu Ser Tyr Asn Thr Ala Thr Thr Ala Gly Phe  
6385 6390 6395 6400

Thr Phe Trp Val Tyr Lys Thr Phe Asp Phe Tyr Asn Leu Trp Asn Thr  
6405 6410 6415

Phe Thr Lys Leu Gln Ser Leu Glu Asn Val Val Tyr Asn Leu Val Lys  
6420 6425 6430

Thr Gly His Tyr Thr Gly Gln Ala Gly Glu Met Pro Cys Ala Ile Ile  
6435 6440 6445

Asn Asp Lys Val Val Ala Lys Ile Asp Lys Glu Asp Val Val Ile Phe  
6450 6455 6460

Ile Asn Asn Thr Thr Tyr Pro Thr Asn Val Ala Val Glu Leu Phe Ala  
6465 6470 6475 6480

Lys Arg Ser Ile Arg His His Pro Glu Leu Lys Leu Phe Arg Asn Leu  
6485 6490 6495

Asn Ile Asp Val Cys Trp Lys His Val Ile Trp Asp Tyr Ala Arg Glu  
6500 6505 6510

SEQLIST-20480.TXT

Ser Ile Phe Cys Ser Asn Thr Tyr Gly Val Cys Met Tyr Thr Asp Leu  
6515 6520 6525

Lys Phe Ile Asp Lys Leu Asn Val Leu Phe Asp Gly Arg Asp Asn Gly  
6530 6535 6540

Ala Leu Glu Ala Phe Lys Arg Ser Asn Asn Gly Val Tyr Ile Ser Thr  
6545 6550 6555 6560

Thr Lys Val Lys Ser Leu Ser Met Ile Lys Gly Pro Pro Arg Ala Glu  
6565 6570 6575

Leu Asn Gly Val Val Val Asp Lys Val Gly Asp Thr Asp Cys Val Phe  
6580 6585 6590

Tyr Phe Ala Val Arg Lys Glu Gly Gln Asp Val Ile Phe Ser Gln Phe  
6595 6600 6605

Asp Ser Leu Arg Val Ser Ser Asn Gln Ser Pro Gln Gly Asn Leu Gly  
6610 6615 6620

Ser Asn Glu Pro Gly Asn Val Gly Gly Asn Asp Ala Leu Ala Thr Ser  
6625 6630 6635 6640

Thr Ile Phe Thr Gln Ser Arg Val Ile Ser Ser Phe Thr Cys Arg Thr  
6645 6650 6655

Asp Met Glu Lys Asp Phe Ile Ala Leu Asp Gln Asp Leu Phe Ile Gln  
6660 6665 6670

Lys Tyr Gly Leu Glu Asp Tyr Ala Phe Glu His Ile Val Tyr Gly Asn  
6675 6680 6685

Phe Asn Gln Lys Ile Ile Gly Gly Leu His Leu Leu Ile Gly Leu Tyr  
6690 6695 6700

Arg Arg Gln Gln Thr Ser Asn Leu Val Ile Gln Glu Phe Val Ser Tyr  
6705 6710 6715 6720

Asp Ser Ser Ile His Ser Tyr Phe Ile Thr Asp Glu Lys Ser Gly Gly  
6725 6730 6735

Ser Lys Ser Val Cys Thr Val Ile Asp Ile Leu Leu Asp Asp Phe Val  
6740 6745 6750

Ala Leu Val Lys Ser Leu Asn Leu Asn Cys Val Ser Lys Val Val Asn  
6755 6760 6765

Val Asn Val Asp Phe Lys Asp Phe Gln Phe Met Leu Trp Cys Asn Asp  
6770 6775 6780

Glu Lys Val Met Thr Phe Tyr Pro Arg Leu Gln Ala Ala Ser Asp Trp  
6785 6790 6795 6800

Lys Pro Gly Tyr Ser Met Pro Val Leu Tyr Lys Tyr Leu Asn Ser Pro  
6805 6810 6815

Met Glu Arg Val Ser Leu Trp Asn Tyr Gly Lys Pro Val Thr Leu Pro  
6820 6825 6830

Thr Gly Cys Met Met Asn Val Ala Lys Tyr Thr Gln Leu Cys Gln Tyr  
6835 6840 6845

SEQLIST-20480.TXT

Leu Asn Thr Thr Thr Leu Ala Val Pro Val Asn Met Arg Val Leu His  
6850 6855 6860

Leu Gly Ala Gly Ser Glu Lys Gly Val Ala Pro Gly Ser Ala Val Leu  
6865 6870 6875 6880

Arg Gln Trp Leu Pro Ala Gly Thr Ile Leu Val Asp Asn Asp Leu Tyr  
6885 6890 6895

Pro Phe Val Ser Asp Ser Val Ala Thr Tyr Phe Gly Asp Cys Ile Thr  
6900 6905 6910

Leu Pro Phe Asp Cys Gln Trp Asp Leu Ile Ile Ser Asp Met Tyr Asp  
6915 6920 6925

Pro Ile Thr Lys Asn Ile Gly Glu Tyr Asn Val Ser Lys Asp Gly Phe  
6930 6935 6940

Phe Thr Tyr Ile Cys His Met Ile Arg Asp Lys Leu Ala Leu Gly Gly  
6945 6950 6955 6960

Ser Val Ala Ile Lys Ile Thr Glu Phe Ser Trp Asn Ala Glu Leu Tyr  
6965 6970 6975

Lys Leu Met Gly Tyr Phe Ala Phe Trp Thr Val Phe Cys Thr Asn Ala  
6980 6985 6990

Asn Ala Ser Ser Ser Glu Gly Phe Leu Ile Gly Ile Asn Tyr Leu Gly  
6995 7000 7005

Lys Pro Lys Val Glu Ile Asp Gly Asn Val Met His Ala Asn Tyr Leu  
7010 7015 7020

Phe Trp Arg Asn Ser Thr Val Trp Asn Gly Gly Ala Tyr Ser Leu Phe  
7025 7030 7035 7040

Asp Met Ala Lys Phe Pro Leu Lys Leu Ala Gly Thr Ala Val Ile Asn  
7045 7050 7055

Leu Arg Ala Asp Gln Ile Asn Asp Met Val Tyr Ser Leu Leu Glu Lys  
7060 7065 7070

Gly Lys Leu Leu Val Arg Asp Thr Asn Lys Glu Val Phe Val Gly Asp  
7075 7080 7085

Ser Leu Val Asn Val Ile  
7090

<210> 9887  
<211> 448  
<212> PRT  
<213> Bovine coronavirus

<400> 9887  
Met Ser Phe Thr Pro Gly Lys Gln Ser Ser Ser Arg Ala Ser Ser Gly  
1 5 10 15

Asn Arg Ser Gly Asn Gly Ile Leu Lys Trp Ala Asp Gln Ser Asp Gln  
20 25 30

Ser Arg Asn Val Gln Thr Arg Gly Arg Arg Ala Gln Pro Lys Gln Thr  
35 40 45

SEQLIST-20480.TXT

Ala Thr Ser Gln Gln Pro Ser Gly Gly Asn Val Val Pro Tyr Tyr Ser  
50 55 60  
Trp Phe Ser Gly Ile Thr Gln Phe Gln Lys Gly Lys Glu Phe Glu Phe  
65 70 75 80  
Ala Glu Gly Gln Gly Val Pro Ile Ala Pro Gly Val Pro Ala Thr Glu  
85 90 95  
Ala Lys Gly Tyr Trp Tyr Arg His Asn Arg Arg Ser Phe Lys Thr Ala  
100 105 110  
Asp Gly Asn Gln Arg Gln Leu Leu Pro Arg Trp Tyr Phe Tyr Tyr Leu  
115 120 125  
Gly Thr Gly Pro His Ala Lys Asp Gln Tyr Gly Thr Asp Ile Asp Gly  
130 135 140  
Val Phe Trp Val Ala Ser Asn Gln Ala Asp Val Asn Thr Pro Ala Asp  
145 150 155 160  
Ile Leu Asp Arg Asp Pro Ser Ser Asp Glu Ala Ile Pro Thr Arg Phe  
165 170 175  
Pro Pro Gly Thr Val Leu Pro Gln Gly Tyr Tyr Ile Glu Gly Ser Gly  
180 185 190  
Arg Ser Ala Pro Asn Ser Arg Ser Thr Ser Arg Ala Ser Ser Arg Ala  
195 200 205  
Ser Ser Ala Gly Ser Arg Ser Arg Ala Asp Ser Gly Asn Arg Thr Pro  
210 215 220  
Thr Ser Gly Val Thr Pro Asp Met Ala Asp Gln Ile Ala Ser Leu Val  
225 230 235 240  
Leu Ala Lys Leu Gly Lys Asp Ala Thr Lys Pro Gln Gln Val Thr Lys  
245 250 255  
Gln Thr Ala Lys Glu Ile Arg Gln Lys Ile Leu Asn Lys Pro Arg Gln  
260 265 270  
Lys Arg Ser Pro Asn Lys Gln Cys Thr Val Gln Gln Cys Phe Gly Lys  
275 280 285  
Arg Gly Pro Asn Gln Asn Phe Gly Gly Gly Glu Met Leu Lys Leu Gly  
290 295 300  
Thr Ser Asp Pro Gln Phe Pro Ile Leu Ala Glu Leu Ala Pro Thr Ala  
305 310 315 320  
Gly Ala Phe Phe Phe Gly Ser Arg Leu Glu Leu Ala Lys Val Gln Asn  
325 330 335  
Leu Ser Gly Asn Leu Asp Glu Pro Gln Lys Asp Val Tyr Glu Leu Arg  
340 345 350  
Tyr Asn Gly Ala Ile Arg Phe Asp Ser Thr Leu Ser Gly Phe Glu Thr  
355 360 365  
Ile Met Lys Val Leu Asn Glu Asn Leu Asn Ala Tyr Gln Gln Gln Asp  
370 375 380



SEQLIST-20480.TXT

Gly Met Met Asn Met Ser Pro Lys Pro Gln Arg Gln Arg Gly Gln Lys  
 385 390 395 400  
 Asn Gly Gln Gly Glu Asn Asp Asn Ile Ser Val Ala Ala Pro Lys Ser  
 405 410 415  
 Arg Val Gln Gln Asn Lys Ser Arg Glu Leu Thr Ala Glu Asp Ile Ser  
 420 425 430  
 Leu Leu Lys Lys Met Asp Glu Pro Tyr Thr Glu Asp Thr Ser Glu Ile  
 435 440 445

<210> 9888  
 <211> 424  
 <212> PRT  
 <213> Bovine coronavirus

<400> 9888  
 Met Phe Leu Leu Pro Arg Phe Val Leu Val Ser Cys Ile Ile Gly Ser  
 1 5 10 15  
 Leu Gly Phe Asp Asn Pro Pro Thr Asn Val Val Ser His Leu Asn Gly  
 20 25 30  
 Asp Trp Phe Leu Phe Gly Asp Ser Arg Ser Asp Cys Asn His Val Val  
 35 40 45  
 Thr Thr Asn Pro Arg Asn Tyr Ser Tyr Met Asp Leu Asn Pro Ala Leu  
 50 55 60  
 Cys Asp Ser Gly Lys Ile Ser Ser Lys Ala Gly Asn Ser Ile Phe Arg  
 65 70 75 80  
 Ser Phe His Phe Thr Asp Phe Tyr Asn Tyr Thr Gly Glu Gly Gln Gln  
 85 90 95  
 Ile Ile Phe Tyr Glu Gly Val Asn Phe Thr Pro Tyr His Ala Phe Lys  
 100 105 110  
 Cys Thr Thr Ser Gly Ser Asn Asp Ile Trp Met Gln Asn Lys Gly Leu  
 115 120 125  
 Phe Tyr Thr Gln Leu Tyr Lys Asn Met Ala Val Tyr Arg Ser Leu Thr  
 130 135 140  
 Phe Val Asn Val Pro Tyr Val Tyr Asn Gly Ser Ala Gln Ser Thr Ala  
 145 150 155 160  
 Leu Cys Lys Ser Gly Ser Leu Val Leu Asn Asn Pro Ala Tyr Ile Ala  
 165 170 175  
 Arg Glu Ala Asn Phe Gly Asp Tyr Tyr Tyr Lys Val Glu Ala Asp Phe  
 180 185 190  
 Tyr Leu Ser Gly Cys Asp Glu Tyr Ile Val Pro Leu Cys Ile Phe Asn  
 195 200 205  
 Gly Lys Phe Leu Ser Asn Thr Lys Tyr Tyr Asp Asp Ser Gln Tyr Tyr  
 210 215 220  
 Phe Asn Lys Asp Thr Gly Val Ile Tyr Gly Leu Asn Ser Thr Glu Thr  
 225 230 235 240

SEQLIST-20480.TXT

Ile Thr Thr Gly Phe Asp Phe Asn Cys His Tyr Leu Val Leu Pro Ser  
245 250 255  
Gly Asn Tyr Leu Ala Ile Ser Asn Glu Leu Leu Leu Thr Val Pro Thr  
260 265 270  
Lys Ala Ile Cys Leu Asn Lys Arg Lys Asp Phe Thr Pro Val Gln Val  
275 280 285  
Val Asp Ser Arg Trp Asn Asn Ala Met Gln Ser Asp Asn Met Thr Ala  
290 295 300  
Val Ala Cys Gln Pro Pro Tyr Cys Tyr Phe Arg Asn Ser Thr Thr Asn  
305 310 315 320  
Tyr Val Gly Val Tyr Asp Ile Asn His Gly Asp Ala Gly Phe Thr Ser  
325 330 335  
Ile Leu Ser Gly Leu Leu Tyr Asp Ser Pro Cys Phe Ser Gln Gln Gly  
340 345 350  
Val Phe Arg Tyr Asp Asn Val Ser Ser Val Trp Pro Leu Tyr Pro Tyr  
355 360 365  
Gly Arg Cys Pro Thr Ala Ala Asp Ile Asn Thr Pro Asp Val Pro Ile  
370 375 380  
Cys Val Tyr Asp Pro Leu Pro Ile Ile Leu Leu Gly Ile Leu Leu Gly  
385 390 395 400  
Val Ala Val Ile Ile Ile Val Val Leu Leu Leu Tyr Phe Met Val Asp  
405 410 415

Asn Gly Thr Arg Leu His Asp Ala  
420

<210> 9889  
<211> 84  
<212> PRT  
<213> Bovine coronavirus

<400> 9889  
Met Phe Met Ala Asp Ala Tyr Phe Ala Asp Thr Val Trp Tyr Val Gly  
1 5 10 15  
Gln Ile Ile Phe Ile Val Ala Ile Cys Leu Leu Val Ile Ile Val Val  
20 25 30  
Val Ala Phe Leu Ala Thr Phe Lys Leu Cys Ile Gln Leu Cys Gly Met  
35 40 45  
Cys Asn Thr Leu Val Leu Ser Pro Ser Ile Tyr Val Phe Asn Arg Gly  
50 55 60  
Arg Gln Phe Tyr Glu Phe Tyr Asn Asp Val Lys Pro Pro Val Leu Asp  
65 70 75 80  
Val Asp Asp Val

<210> 9890  
<211> 230

SEQLIST-20480.TXT

<212> PRT  
<213> Bovine coronavirus

<400> 9890

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Met Ser Ser Val Thr Thr Pro Ala Pro Val Tyr Thr Trp Thr Ala Asp
1      5      10      15
Glu Ala Ile Lys Phe Leu Lys Glu Trp Asn Phe Ser Leu Gly Ile Ile
      20      25      30
Leu Leu Phe Ile Thr Val Ile Leu Gln Phe Gly Tyr Thr Ser Arg Ser
      35      40      45
Met Phe Val Tyr Val Ile Lys Met Val Ile Leu Trp Leu Met Trp Pro
      50      55      60
Leu Thr Ile Ile Leu Thr Ile Phe Asn Cys Val Tyr Ala Leu Asn Asn
      65      70      75      80
Val Tyr Leu Gly Phe Ser Ile Val Phe Thr Ile Val Ala Ile Ile Met
      85      90      95
Trp Ile Val Tyr Phe Val Asn Ser Ile Arg Leu Phe Ile Arg Thr Gly
      100     105     110
Ser Trp Trp Ser Phe Asn Pro Glu Thr Asn Asn Leu Met Cys Ile Asp
      115     120     125
Met Lys Gly Arg Met Tyr Val Arg Pro Ile Ile Glu Asp Tyr His Thr
      130     135     140
Leu Thr Val Thr Ile Ile Arg Gly His Leu Tyr Met Gln Gly Ile Lys
      145     150     155     160
Leu Gly Thr Gly Tyr Ser Leu Ser Asp Leu Pro Ala Tyr Val Thr Val
      165     170     175
Ala Lys Val Ser His Leu Leu Thr Tyr Lys Arg Gly Phe Leu Asp Lys
      180     185     190
Ile Gly Asp Thr Ser Gly Phe Ala Val Tyr Val Lys Ser Lys Val Gly
      195     200     205
Asn Tyr Arg Leu Pro Ser Thr Gln Lys Gly Ser Gly Leu Asp Thr Ala
      210     215     220
Leu Leu Arg Asn Asn Ile
      225     230

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<210> 9891  
<211> 1363  
<212> PRT  
<213> Bovine coronavirus

<400> 9891

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Met Phe Leu Ile Leu Leu Ile Ser Leu Pro Thr Ala Phe Ala Val Ile
1      5      10      15
Gly Asp Leu Lys Cys Thr Thr Val Ser Ile Asn Asp Val Asp Thr Gly
      20      25      30
Val Pro Ser Ile Ser Thr Asp Thr Val Asp Val Thr Asn Gly Leu Gly
      35      40      45

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SEQLIST-20480.TXT

Thr Tyr Tyr Val Leu Asp Arg Val Tyr Leu Asn Thr Thr Leu Leu Leu  
 50 55 60  
 Asn Gly Tyr Tyr Pro Thr Ser Gly Ser Thr Tyr Arg Asn Met Ala Leu  
 65 70 75 80  
 Lys Gly Thr Leu Leu Leu Ser Thr Leu Trp Phe Lys Pro Pro Phe Leu  
 85 90 95  
 Ser Asp Phe Thr Asn Gly Ile Phe Ala Lys Val Lys Asn Thr Lys Val  
 100 105 110  
 Ile Lys Asp Gly Val Met Tyr Ser Glu Phe Pro Ala Ile Thr Ile Gly  
 115 120 125  
 Ser Thr Phe Val Asn Thr Ser Tyr Ser Val Val Val Gln Pro His Thr  
 130 135 140  
 Thr Ile Leu Gly Asn Lys Leu Gln Gly Phe Leu Glu Ile Ser Val Cys  
 145 150 155 160  
 Gln Tyr Thr Met Cys Glu Tyr Pro Asn Thr Ile Cys Asn Pro Asn Leu  
 165 170 175  
 Gly Asn Gln Arg Val Glu Leu Trp His Trp Asp Thr Gly Val Val Ser  
 180 185 190  
 Cys Leu Tyr Lys Arg Asn Phe Thr Tyr Asp Val Asn Ala Asp Tyr Leu  
 195 200 205  
 Tyr Phe His Phe Tyr Gln Glu Gly Gly Thr Phe Tyr Ala Tyr Phe Thr  
 210 215 220  
 Asp Thr Gly Val Val Thr Lys Phe Leu Phe Asn Val Tyr Leu Gly Thr  
 225 230 235 240  
 Val Leu Ser His Tyr Tyr Val Met Pro Leu Thr Cys Asn Ser Ala Leu  
 245 250 255  
 Thr Leu Glu Tyr Trp Val Thr Pro Leu Thr Ser Lys Gln Tyr Leu Leu  
 260 265 270  
 Ala Phe Asn Gln Asp Gly Val Ile Phe Asn Ala Val Asp Cys Lys Ser  
 275 280 285  
 Asp Phe Met Ser Glu Ile Lys Cys Lys Thr Leu Ser Ile Ala Pro Ser  
 290 295 300  
 Thr Gly Val Tyr Glu Leu Asn Gly Tyr Thr Val Gln Pro Ile Ala Asp  
 305 310 315 320  
 Val Tyr Arg Arg Ile Pro Asn Leu Pro Asp Cys Asn Ile Glu Ala Trp  
 325 330 335  
 Leu Asn Asp Lys Ser Val Pro Ser Pro Leu Asn Trp Glu Arg Lys Thr  
 340 345 350  
 Phe Ser Asn Cys Asn Phe Asn Met Ser Ser Leu Met Ser Phe Ile Gln  
 355 360 365  
 Ala Tyr Ser Phe Thr Cys Asn Asn Ile Asp Ala Ala Lys Ile Tyr Gly  
 370 375 380

SEQLIST-20480.TXT

Met 385	Cys	Phe	Ser	Ser	Ile 390	Thr	Ile	Asp	Lys	Phe 395	Ala	Ile	Pro	Asn	Gly 400
Arg	Lys	Val	Asp	Leu 405	Gln	Leu	Gly	Asn	Leu 410	Gly	Tyr	Leu	Gln	Ser 415	Phe
Asn	Tyr	Arg	Ile 420	Asp	Thr	Thr	Ala	Thr 425	Ser	Cys	Gln	Leu	Tyr 430	Tyr	Asn
Leu	Pro	Ala 435	Ala	Asn	Val	Ser	Val 440	Ser	Arg	Phe	Asn	Pro 445	Ser	Thr	Trp
Asn	Arg 450	Arg	Phe	Gly	Phe	Thr 455	Glu	Gln	Ser	Val	Phe 460	Lys	Pro	Gln	Pro
Ala 465	Gly	Val	Phe	Thr	Asp 470	His	Asp	Val	Val	Tyr 475	Ala	Gln	His	Cys	Phe 480
Lys	Ala	Ser	Thr	Asn 485	Phe	Cys	Pro	Cys	Lys 490	Leu	Asp	Gly	Ser	Leu 495	Cys
Val	Gly	Asn	Gly 500	Pro	Gly	Ile	Asp	Ala 505	Gly	Tyr	Lys	Thr	Ser 510	Gly	Ile
Gly	Thr	Cys 515	Pro	Ala	Gly	Thr	Asn 520	Tyr	Leu	Thr	Cys	His 525	Asn	Ala	Ala
Gln	Cys 530	Asp	Cys	Leu	Cys	Thr 535	Pro	Asp	Pro	Ile	Thr 540	Ser	Lys	Ala	Thr
Gly 545	Pro	Tyr	Lys	Cys	Pro 550	Gln	Thr	Lys	Tyr	Leu 555	Val	Gly	Ile	Gly	Glu 560
His	Cys	Ser	Gly	Leu 565	Ala	Ile	Lys	Ser	Asp 570	His	Cys	Gly	Gly	Asn 575	Pro
Cys	Thr	Cys	Gln 580	Pro	Gln	Ala	Phe	Leu 585	Gly	Trp	Ser	Val	Asp 590	Ser	Cys
Leu	Gln	Gly 595	Asp	Arg	Cys	Asn	Ile 600	Phe	Ala	Asn	Phe	Ile 605	Leu	His	Asp
Val	Asn 610	Ser	Gly	Thr	Thr	Cys 615	Ser	Thr	Asp	Leu	Gln 620	Lys	Ser	Asn	Thr
Asp 625	Ile	Ile	Leu	Gly	Val 630	Cys	Val	Asn	Tyr	Asp 635	Leu	Tyr	Gly	Ile	Thr 640
Gly	Gln	Gly	Ile	Phe 645	Val	Glu	Val	Asn	Ala 650	Thr	Tyr	Tyr	Asn	Ser 655	Trp
Gln	Asn	Leu	Leu 660	Tyr	Asp	Ser	Asn	Gly 665	Asn	Leu	Tyr	Gly	Phe 670	Arg	Asp
Tyr	Leu	Thr 675	Asn	Arg	Thr	Phe	Met 680	Ile	Arg	Ser	Cys	Tyr 685	Ser	Gly	Arg
Val	Ser 690	Ala	Ala	Phe	His	Ala 695	Asn	Ser	Ser	Glu	Pro 700	Ala	Leu	Leu	Phe
Arg 705	Asn	Ile	Lys	Cys	Asn 710	Tyr	Val	Phe	Asn	Asn 715	Thr	Leu	Ser	Arg	Gln 720

SEQLIST-20480.TXT

Leu Gln Pro Ile Asn Tyr Phe Asp Ser Tyr Leu Gly Cys Val Val Asn  
 725 730 735  
 Ala Asp Asn Ser Thr Ser Ser Val Val Gln Thr Cys Asp Leu Thr Val  
 740 745 750  
 Gly Ser Gly Tyr Cys Val Asp Tyr Ser Thr Lys Arg Arg Ser Arg Arg  
 755 760 765  
 Ser Ile Thr Thr Gly Tyr Arg Phe Thr Asn Phe Glu Pro Phe Thr Val  
 770 775 780  
 Asn Ser Val Asn Asp Ser Leu Glu Pro Val Gly Gly Leu Tyr Glu Ile  
 785 790 795 800  
 Gln Ile Pro Ser Glu Phe Thr Ile Gly Asn Met Glu Glu Phe Ile Gln  
 805 810 815  
 Thr Ser Ser Pro Lys Val Thr Ile Asp Cys Ser Ala Phe Val Cys Gly  
 820 825 830  
 Asp Tyr Ala Ala Cys Lys Ser Gln Leu Val Glu Tyr Gly Ser Phe Cys  
 835 840 845  
 Asp Asn Ile Asn Ala Ile Leu Thr Glu Val Asn Glu Leu Leu Asp Thr  
 850 855 860  
 Thr Gln Leu Gln Val Ala Asn Ser Leu Met Asn Gly Val Thr Leu Ser  
 865 870 875 880  
 Thr Lys Leu Lys Asp Gly Val Asn Phe Asn Val Asp Asp Ile Asn Phe  
 885 890 895  
 Ser Pro Val Leu Gly Cys Leu Gly Ser Asp Cys Asn Lys Val Ser Ser  
 900 905 910  
 Arg Ser Ala Ile Glu Asp Leu Leu Phe Ser Lys Val Lys Leu Ser Asp  
 915 920 925  
 Val Gly Phe Val Glu Ala Tyr Asn Asn Cys Thr Gly Gly Ala Glu Ile  
 930 935 940  
 Arg Asp Leu Ile Cys Val Gln Ser Tyr Asn Gly Ile Lys Val Leu Pro  
 945 950 955 960  
 Pro Leu Leu Ser Glu Asn Gln Ile Ser Gly Tyr Thr Leu Ala Ala Thr  
 965 970 975  
 Ser Ala Ser Leu Phe Pro Pro Trp Ser Ala Ala Ala Gly Val Pro Phe  
 980 985 990  
 Tyr Leu Asn Val Gln Tyr Arg Ile Asn Gly Ile Gly Val Thr Met Asp  
 995 1000 1005  
 Val Leu Ser Gln Asn Gln Lys Leu Ile Ala Asn Ala Phe Asn Asn Ala  
 1010 1015 1020  
 Leu Gly Ala Ile Gln Glu Gly Phe Asp Ala Thr Asn Ser Ala Leu Val  
 1025 1030 1035 1040  
 Lys Ile Gln Ala Val Val Asn Ala Asn Ala Glu Ala Leu Asn Asn Leu  
 1045 1050 1055

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Leu Gln Gln Leu Ser Asn Arg Phe Gly Ala Ile Ser Ser Ser Leu Gln  
 1060 1065 1070  
 Glu Ile Leu Ser Arg Leu Asp Ala Leu Glu Ala Gln Ala Gln Ile Asp  
 1075 1080 1085  
 Arg Leu Ile Asn Gly Arg Leu Thr Ala Leu Asn Ala Tyr Val Ser Gln  
 1090 1095 1100  
 Gln Leu Ser Asp Ser Thr Leu Val Lys Phe Ser Ala Ala Gln Ala Met  
 1105 1110 1115 1120  
 Glu Lys Val Asn Glu Cys Val Lys Ser Gln Ser Ser Arg Ile Asn Phe  
 1125 1130 1135  
 Cys Gly Asn Gly Asn His Ile Ile Ser Leu Val Gln Asn Ala Pro Tyr  
 1140 1145 1150  
 Gly Leu Tyr Phe Ile His Phe Ser Tyr Val Pro Thr Lys Tyr Val Thr  
 1155 1160 1165  
 Ala Lys Val Ser Pro Gly Leu Cys Ile Ala Gly Asp Arg Gly Ile Ala  
 1170 1175 1180  
 Pro Lys Ser Gly Tyr Phe Val Asn Val Asn Asn Thr Trp Met Phe Thr  
 1185 1190 1195 1200  
 Gly Ser Gly Tyr Tyr Tyr Pro Glu Pro Ile Thr Gly Asn Asn Val Val  
 1205 1210 1215  
 Val Met Ser Thr Cys Ala Val Asn Tyr Thr Lys Ala Pro Asp Val Met  
 1220 1225 1230  
 Leu Asn Ile Ser Thr Pro Asn Leu Pro Tyr Phe Lys Glu Glu Leu Asp  
 1235 1240 1245  
 Gln Trp Phe Lys Asn Gln Thr Ser Val Ala Pro Asp Leu Ser Leu Asp  
 1250 1255 1260  
 Tyr Ile Asn Val Thr Phe Leu Asp Leu Gln Asp Glu Met Asn Arg Leu  
 1265 1270 1275 1280  
 Gln Glu Ala Ile Lys Val Leu Asn Gln Ser Tyr Ile Asn Leu Lys Asp  
 1285 1290 1295  
 Ile Gly Thr Tyr Glu Tyr Tyr Val Lys Trp Pro Trp Tyr Val Trp Leu  
 1300 1305 1310  
 Leu Ile Gly Phe Ala Gly Val Ala Met Leu Val Leu Leu Phe Phe Ile  
 1315 1320 1325  
 Cys Cys Cys Thr Gly Cys Gly Thr Ser Cys Phe Lys Lys Cys Gly Gly  
 1330 1335 1340  
 Cys Cys Asp Asp Tyr Thr Gly His Gln Glu Leu Val Ile Lys Thr Ser  
 1345 1350 1355 1360  
 His Glu Asp

<210> 9892  
 <211> 213

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<212> DNA  
<213> Bovine coronavirus

<400> 9892  
gattgagc gatttgcgtg cgtgcatccc gcttcactga tctcttgta gatcttttca 60  
taatctaac ttataaaaa catccactcc ctgtagtcta tgcctgtggg cgtagatttt 120  
tcatagtgt gtctatattc atttctgctg ttaacagctt tcagccaggg acgtgttgta 180  
tcctaggcag tggcccaccc ataggtcaca atg 213

<210> 9893  
<211> 289  
<212> DNA  
<213> Bovine coronavirus

<400> 9893  
gagaatgaac tttatgtcgg cacctggtgg taacccctcg caggaaagtc gggataaggc 60  
actctctatc agaattggatg tcttgctgct ataataagata gagaagggtta tagcagacta 120  
tagattaatt agttgaaagt tttgtgtggt aatgtatagt gttggagaaa gtgaaagact 180  
tgcggaagta attgccgaca agtgcccaag gggaagagcc agcatgttaa gttaccatcc 240  
agtaattagt aaatgaatga agttaattat ggccaattgg aagaatcac 289

<210> 9894  
<211> 1356  
<212> DNA  
<213> Murine hepatitis virus

<400> 9894  
atgtcttttg ttcctgggca agaaaatgcc ggtagcagaa gctcctctgg aaaccgcgct 60  
ggtaattggca tcctcaagaa gaccacttgg gctgaccaa cccagcgctg aaatagaggc 120  
agaagggaacc atccaagca gactgcaact actcagccca atgccgggag tgtggttccc 180  
cattactctt ggttttcggg catcacccag tttcaaaagg gaaaggagtt ccagtttgca 240  
caaggacagg gagtgcctat tgccagtggg atccccgctt cagagcaaaa gggatattgg 300  
tatagacaca accgacgttc ttttaaaaca cctgatggcc agcacaagca gctactgccc 360  
agatgggtatt tttactatct tggaacaggg ccccatgctg gcgcagagta tggcgacgat 420  
atcgaaggag ttgtctgggt cgcaagccaa caggccgaca ctaagaccac tgccgatggt 480  
gttgaaaggg acccaagcag tcatgaggct attcctacta ggtttgcgcc cggcacggta 540  
ttgcctcagg gcttttatgt agaaggctcg ggaaggctcg cacttgctag tcgatctggt 600  
tcgcggtcac aatcccgtgg gccaaataat cgcgctagaa gcagttccaa ccagcgccag 660  
cctgcctctg ctgtaaaacc tgacatggcc gaagaaattg ctgctcttgt tttggctaag 720  
cttggttaaag atgccggcca gcccagcag gtaactaagc aaagcgcca agaagtcagg 780  
cagaaaaatt taactaagcc tcgtcaaaag aagactccaa acaagcagtg cccagtgca 840  
cagtgttttg ggaagagagg ccctaactcag aactttggag gctctgaaat gttaaaactt 900  
ggaactagt atccgcagtt cccattctt gcagagttgg ctccaacacc tagtgcttc 960  
ttctttggat cttaaattaga attggtcaaa aagaactctg gtggtgctga tgaaccacc 1020  
aaagatggt atgaattgca gtattcagg gcaattagat ttgatagtag tctaccggg 1080  
tttgagacta tcatgaaagt gttgactgag aatttgaatg cctaccagga ccaagctggt 1140  
agtgtagatc tagtgagccc aaagcctcca agaagaggtc gtagacaggc tcaagaaaag 1200  
aaagatgaag tagataatgt aagcgttgca aagctcaaaa gcttggtgca gcgaaatgta 1260  
agtagagaat taacccccga ggatcgtagc ctgctggctc agatcctaga cgatggcggt 1320  
gtgccagatg gggtggaaga tgactcta atgtgtaa 1356

<210> 9895  
<211> 687  
<212> DNA  
<213> Murine hepatitis virus

<400> 9895  
atgactagta ccactcaggc tccacagcct gtttatcagt ggacggctga tgaggcaatt 60  
cgattcctta aggaatggaa tttctctctc ggcattatac tactttttgt tactatcata 120  
ctacagttcg gttacacgag ccgtagcatg tttgtttatg ttgtgaaaat gatactttt 180  
tgcgttatgt ggccactaac tattgttttg actgtgctta tgcgctaaat 240  
aatgtgtatc ttggattttc tatagtgttt actatagtgt ccattataat gtggattatg 300  
tattttgtta atagcatcag gttgtttatc aggactggca gctggtggag cttcaacccc 360



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gaaacaaaca	acctaattgtg	tatagatatg	aaagggtactg	tgtatggttag	acccattata	420
gaggattacc	atacactaac	agccactatc	attcgtgggtc	acctctatat	gcaagggtgtt	480
aagctaggca	ctggcttctc	tttgtctgat	ttgcctgctt	atgttacagt	tgctaagggtg	540
tctcaccttt	gcacttataa	gcgcgcattc	ttagacaagg	tagacgggtg	tagcgggtttt	600
gctgtttatg	tgaagtccaa	ggtcggaaat	taccgactgc	cttcaaataa	accgagtggc	660
atggacaccg	cattgtttgag	aatctaa				687

<210> 9896  
 <211> 886  
 <212> DNA  
 <213> Murine hepatitis virus

<400> 9896	
atgggcaata	aagctcgatt
ctatcgtttg	ttaatgtgtc
aaagacaata	ctttaacact
gattagtacc	gctctgtggg
taaatattat	actgactctc
caattcgacc	ttggatgttg
gtatcttgca	ttgactcctg
accctcaaag	gctattttgc
ctcaagggtg	agtagcatcc
atattgtttc	tttcgcaaca
tggtgatatt	catttcaggc
ccagcagggt	gcattttctt
tcattgtcca	acggcagcta
cccggtcata	ctgctagggt
gttttatttt	atgacggata
ttatgcccga	gtgtatgaga
ttatgcctat	ggaggtaatg
caataacccc	accttcataat
ttaatggcca	ttccaagggc
agagttacta	taatatggat
gcaacactgc	taaggatccg
gtaattataa	ggctgtgtcc
tccataagac	aaagcgcttt
gccagtcaga	caatatgacc
catctgcgaa	ttatagtggg
agttattgtc	tggtttgtta
ataataatgt	tagttcctct
tatggcacct	gtttgtatct
tatagctgtg	ttgattattg
attgcatgag	gcataa
agatggccca	atataggagc
caaagcccgc	ctccatttgc
cgaaggagtc	taattatggt
agctcttcgg	atgctgccaa
ggctcttgatc	tcacttgcag
ttagaatatt	tgtaaagctt
atgcctgtgc	aggtagttga
gctgcagcct	gtcagctgcc
ggcacacatg	atgcgcacca
tataatgttt	cctgtattgc
tggccagcct	atgggtacgg
atgacctct	atgacctct
tggttttgat	

<210> 9897  
 <211> 7176  
 <212> PRT  
 <213> Murine hepatitis virus

<400> 9897	
Met Ala Lys Met Gly Lys Tyr Gly Leu Gly Phe Lys Trp Ala Pro Glu	
1 5 10 15	
Phe Pro Trp Met Leu Pro Asn Ala Ser Glu Lys Leu Gly Asn Pro Glu	
20 25 30	
Arg Ser Glu Glu Asp Gly Phe Cys Pro Ser Ala Ala Gln Glu Pro Lys	
35 40 45	
Val Lys Gly Lys Thr Leu Val Asn His Val Arg Val Asn Cys Ser Arg	
50 55 60	
Leu Pro Ala Leu Glu Cys Val Gln Ser Ala Ile Ile Arg Asp Ile	
65 70 75 80	
Phe Val Asp Glu Asp Pro Gln Lys Val Glu Ala Ser Thr Met Met Ala	
85 90 95	
Leu Gln Phe Gly Ser Ala Val Leu Val Lys Pro Ser Lys Arg Leu Ser	
100 105 110	
Ile Gln Ala Trp Thr Asn Leu Gly Val Leu Pro Lys Thr Ala Ala Met	
115 120 125	
Gly Leu Phe Lys Arg Val Cys Leu Cys Asn Thr Arg Glu Cys Ser Cys	
130 135 140	
Asp Ala His Val Ala Phe His Leu Phe Thr Val Gln Pro Asp Gly Val	

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145					150					155					160
Cys	Leu	Gly	Asn	Gly <sub>165</sub>	Arg	Phe	Ile	Gly	Trp <sub>170</sub>	Phe	Val	Pro	Val	Thr <sub>175</sub>	Ala
Ile	Pro	Glu	Tyr <sub>180</sub>	Ala	Lys	Gln	Trp	Leu <sub>185</sub>	Gln	Pro	Trp	Ser	Ile <sub>190</sub>	Leu	Leu
Arg	Lys	Gly <sub>195</sub>	Gly	Asn	Lys	Gly	Ser <sub>200</sub>	Val	Thr	Ser	Gly	His <sub>205</sub>	Phe	Arg	Arg
Ala	Val <sub>210</sub>	Thr	Met	Pro	Val	Tyr <sub>215</sub>	Asp	Phe	Asn	Val	Glu <sub>220</sub>	Asp	Ala	Cys	Glu
Glu <sub>225</sub>	Val	His	Leu	Asn	Pro <sub>230</sub>	Lys	Gly	Lys	Tyr	Ser <sub>235</sub>	Cys	Lys	Ala	Tyr	Ala <sub>240</sub>
Leu	Leu	Lys	Gly	Tyr <sub>245</sub>	Arg	Gly	Val	Lys	Pro <sub>250</sub>	Ile	Leu	Phe	Val	Asp <sub>255</sub>	Gln
Tyr	Gly	Cys	Asp <sub>260</sub>	Tyr	Thr	Gly	Cys	Leu <sub>265</sub>	Ala	Lys	Gly	Leu	Glu <sub>270</sub>	Asp	Tyr
Gly	Asp	Leu <sub>275</sub>	Thr	Leu	Ser	Glu	Met <sub>280</sub>	Lys	Glu	Leu	Phe	Pro <sub>285</sub>	Val	Trp	Arg
Asp	Ser <sub>290</sub>	Leu	Asp	Ser	Glu	Val <sub>295</sub>	Leu	Val	Ala	Trp	His <sub>300</sub>	Val	Asp	Arg	Asp
Pro	Arg	Ala	Ala	Met	Arg <sub>310</sub>	Leu	Gln	Thr	Leu	Ala <sub>315</sub>	Thr	Val	Arg	Cys	Ile <sub>320</sub>
Asp	Tyr	Val	Gly	Gln <sub>325</sub>	Pro	Thr	Glu	Asp	Val <sub>330</sub>	Val	Asp	Gly	Asp	Val <sub>335</sub>	Val
Val	Arg	Glu	Pro <sub>340</sub>	Ala	His	Leu	Leu	Ala <sub>345</sub>	Ala	Asn	Ala	Ile	Val <sub>350</sub>	Lys	Arg
Leu	Pro	Arg <sub>355</sub>	Leu	Val	Glu	Thr	Met <sub>360</sub>	Leu	Tyr	Thr	Asp	Ser <sub>365</sub>	Ser	Val	Thr
Glu	Phe <sub>370</sub>	Cys	Tyr	Lys	Thr	Lys <sub>375</sub>	Leu	Cys	Glu	Cys	Gly <sub>380</sub>	Phe	Ile	Thr	Gln
Phe	Gly	Tyr	Val	Asp	Cys <sub>390</sub>	Cys	Gly	Asp	Thr	Cys <sub>395</sub>	Asp	Phe	Arg	Gly	Trp <sub>400</sub>
Val	Ala	Gly	Asn	Met <sub>405</sub>	Met	Asp	Gly	Phe	Pro <sub>410</sub>	Cys	Pro	Gly	Cys	Thr <sub>415</sub>	Lys
Asn	Tyr	Met	Pro <sub>420</sub>	Trp	Glu	Leu	Glu	Ala <sub>425</sub>	Gln	Ser	Ser	Gly	Val <sub>430</sub>	Ile	Pro
Glu	Gly	Gly <sub>435</sub>	Val	Leu	Phe	Thr	Gln <sub>440</sub>	Ser	Thr	Asp	Thr	Val <sub>445</sub>	Asn	Arg	Glu
Ser	Phe <sub>450</sub>	Lys	Leu	Tyr	Gly	His <sub>455</sub>	Ala	Val	Val	Pro	Phe <sub>460</sub>	Gly	Ser	Ala	Val
Tyr	Trp	Ser	Pro	Cys	Pro <sub>470</sub>	Gly	Met	Trp	Leu	Pro <sub>475</sub>	Val	Ile	Trp	Ser	Ser <sub>480</sub>
Val	Lys	Ser	Tyr	Ser	Gly	Leu	Thr	Tyr	Thr	Gly	Val	Val	Gly	Cys	Lys

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485

490

495

Ala Ile Val Gln Glu Thr Asp Ala Ile Cys Arg Ser Leu Tyr Met Asp  
500 505 510  
Tyr Val Gln His Lys Cys Gly Asn Leu Glu Gln Arg Ala Ile Leu Gly  
515 520 525  
Leu Asp Asp Val Tyr His Arg Gln Leu Leu Val Asn Arg Gly Asp Tyr  
530 535 540  
Ser Leu Leu Leu Glu Asn Val Asp Leu Phe Val Lys Arg Arg Ala Glu  
545 550 555 560  
Phe Ala Cys Lys Phe Ala Thr Cys Gly Asp Gly Leu Val Pro Leu Leu  
565 570 575  
Leu Asp Gly Leu Val Pro Arg Ser Tyr Tyr Leu Ile Lys Ser Gly Gln  
580 585 590  
Ala Phe Thr Ser Met Met Val Asn Phe Ser His Glu Val Thr Asp Met  
595 600 605  
Cys Met Asp Met Ala Leu Leu Phe Met His Asp Val Lys Val Ala Thr  
610 615 620  
Lys Tyr Val Lys Lys Val Thr Gly Lys Leu Ala Val Arg Phe Lys Ala  
625 630 635 640  
Leu Gly Val Ala Val Val Arg Lys Ile Thr Glu Trp Phe Asp Leu Ala  
645 650 655  
Val Asp Ile Ala Ala Ser Ala Ala Gly Trp Leu Cys Tyr Gln Leu Val  
660 665 670  
Asn Gly Leu Phe Ala Val Ala Asn Gly Val Ile Thr Phe Val Gln Glu  
675 680 685  
Val Pro Glu Leu Val Lys Asn Phe Val Asp Lys Phe Lys Ala Phe Phe  
690 695 700  
Lys Val Leu Ile Asp Ser Met Ser Val Ser Ile Leu Ser Gly Leu Thr  
705 710 715 720  
Val Val Lys Thr Ala Ser Asn Arg Val Cys Leu Ala Gly Ser Lys Val  
725 730 735  
Tyr Glu Val Val Gln Lys Ser Leu Ser Ala Tyr Val Met Pro Val Gly  
740 745 750  
Cys Ser Glu Ala Thr Cys Leu Val Gly Glu Ile Glu Pro Ala Val Phe  
755 760 765  
Glu Asp Asp Val Val Asp Val Val Lys Ala Pro Leu Thr Tyr Gln Gly  
770 775 780  
Cys Cys Lys Pro Pro Thr Ser Phe Glu Lys Ile Cys Ile Val Asp Lys  
785 790 795 800  
Leu Tyr Met Ala Lys Cys Gly Asp Gln Phe Tyr Pro Val Val Val Asp  
805 810 815  
Asn Asp Thr Val Gly Val Leu Asp Gln Cys Trp Arg Phe Pro Cys Ala

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820 825 830

Gly Lys Lys Val Glu Phe Asn Asp Lys Pro Lys Val Arg Lys Ile Pro  
835 840 845

Ser Thr Arg Lys Ile Lys Ile Thr Phe Ala Leu Asp Ala Thr Phe Asp  
850 855 860

Ser Val Leu Ser Lys Ala Cys Ser Glu Phe Glu Val Asp Lys Asp Val  
865 870 875 880

Thr Leu Asp Glu Leu Leu Asp Val Val Leu Asp Ala Val Glu Ser Thr  
885 890 895

Leu Ser Pro Cys Lys Glu His Asp Val Ile Gly Thr Lys Val Cys Ala  
900 905 910

Leu Leu Asp Arg Leu Ala Gly Asp Tyr Val Tyr Leu Phe Asp Glu Gly  
915 920 925

Gly Asp Glu Val Ile Ala Pro Arg Met Tyr Cys Ser Phe Ser Ala Pro  
930 935 940

Asp Asp Glu Asp Cys Val Ala Ala Asp Val Val Asp Ala Asp Glu Asn  
945 950 955 960

Gln Asp Asp Asp Ala Glu Asp Ser Ala Val Leu Val Ala Asp Thr Gln  
965 970 975

Glu Glu Asp Gly Val Ala Lys Gly Gln Val Glu Ala Asp Ser Glu Ile  
980 985 990

Cys Val Ala His Thr Gly Ser Gln Glu Glu Leu Ala Glu Pro Asp Ala  
995 1000 1005

Val Gly Ser Gln Thr Pro Ile Ala Ser Ala Glu Glu Thr Glu Val Gly  
1010 1015 1020

Glu Ala Ser Asp Arg Glu Gly Ile Ala Glu Ala Lys Ala Thr Val Cys  
1025 1030 1035 1040

Ala Asp Ala Val Asp Ala Cys Pro Asp Gln Val Glu Ala Phe Glu Ile  
1045 1050 1055

Glu Lys Val Glu Asp Ser Ile Leu Asp Glu Leu Gln Thr Glu Leu Asn  
1060 1065 1070

Ala Pro Ala Asp Lys Thr Tyr Glu Asp Val Leu Ala Phe Asp Ala Val  
1075 1080 1085

Cys Ser Glu Ala Leu Ser Ala Phe Tyr Ala Val Pro Ser Asp Glu Thr  
1090 1095 1100

His Phe Lys Val Cys Gly Phe Tyr Ser Pro Ala Ile Glu Arg Thr Asn  
1105 1110 1115 1120

Cys Trp Leu Arg Ser Thr Leu Ile Val Met Gln Ser Leu Pro Leu Glu  
1125 1130 1135

Phe Lys Asp Leu Glu Met Gln Lys Leu Trp Leu Ser Tyr Lys Ala Gly  
1140 1145 1150

Tyr Asp Gln Cys Phe Val Asp Lys Leu Val Lys Ser Val Pro Lys Ser

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1155 1160 1165  
 Ile Ile Leu Pro Gln Gly Gly Tyr Val Ala Asp Phe Ala Tyr Phe Phe  
 1170 1175 1180  
 Leu Ser Gln Cys Ser Phe Lys Ala Tyr Ala Asn Trp Arg Cys Leu Glu  
 1185 1190 1195 1200  
 Cys Asp Met Glu Leu Lys Leu Gln Gly Leu Asp Ala Met Phe Phe Tyr  
 1205 1210 1215  
 Gly Asp Val Val Ser His Met Cys Lys Cys Gly Asn Ser Met Thr Leu  
 1220 1225 1230  
 Leu Ser Ala Asp Ile Pro Tyr Thr Leu His Phe Gly Val Arg Asp Asp  
 1235 1240 1245  
 Lys Phe Cys Ala Phe Tyr Thr Pro Arg Lys Val Phe Arg Ala Ala Cys  
 1250 1255 1260  
 Ala Val Asp Val Asn Asp Cys His Ser Met Ala Val Val Glu Gly Lys  
 1265 1270 1275 1280  
 Gln Ile Asp Gly Lys Val Val Thr Lys Phe Ile Gly Asp Lys Phe Asp  
 1285 1290 1295  
 Phe Met Val Gly Tyr Gly Met Thr Phe Ser Met Ser Pro Phe Glu Leu  
 1300 1305 1310  
 Ala Gln Leu Tyr Gly Ser Cys Ile Thr Pro Asn Val Cys Phe Val Lys  
 1315 1320 1325  
 Gly Asp Val Ile Lys Val Val Arg Leu Val Asn Ala Glu Val Ile Val  
 1330 1335 1340  
 Asn Pro Ala Asn Gly Arg Met Ala His Gly Ala Gly Val Ala Gly Ala  
 1345 1350 1355 1360  
 Ile Ala Glu Lys Ala Gly Ser Ala Phe Ile Lys Glu Thr Ser Asp Met  
 1365 1370 1375  
 Val Lys Ala Gln Gly Val Cys Gln Val Gly Glu Cys Tyr Glu Ser Ala  
 1380 1385 1390  
 Gly Gly Lys Leu Cys Lys Lys Val Leu Asn Ile Val Gly Pro Asp Ala  
 1395 1400 1405  
 Arg Gly His Gly Lys Gln Cys Tyr Ser Leu Leu Glu Arg Ala Tyr Gln  
 1410 1415 1420  
 His Ile Asn Lys Cys Asp Asn Val Val Thr Thr Leu Ile Ser Ala Gly  
 1425 1430 1435 1440  
 Ile Phe Ser Val Pro Thr Asp Val Ser Leu Thr Tyr Leu Leu Gly Val  
 1445 1450 1455  
 Val Thr Lys Asn Val Ile Leu Val Ser Asn Asn Gln Asp Asp Phe Asp  
 1460 1465 1470  
 Val Ile Glu Lys Cys Gln Val Thr Ser Val Ala Gly Thr Lys Ala Leu  
 1475 1480 1485  
 Ser Leu Gln Leu Ala Lys Asn Leu Cys Arg Asp Val Lys Phe Val Thr

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1490		1495		1500
Asn Ala Cys Ser Ser	Leu Phe Ser Glu Ser Cys Phe Val Ser Ser Tyr			
1505	1510	1515		1520
Asp Val Leu Gln Glu Val Glu Ala Leu Arg His Asp Ile Gln Leu Asp				
	1525	1530		1535
Asp Asp Ala Arg Val Phe Val Gln Ala Asn Met Asp Cys Leu Pro Thr				
	1540	1545		1550
Asp Trp Arg Leu Val Asn Lys Phe Asp Ser Val Asp Gly Val Arg Thr				
	1555	1560		1565
Ile Lys Tyr Phe Glu Cys Pro Gly Gly Ile Phe Val Ser Ser Gln Gly				
	1570	1575		1580
Lys Lys Phe Gly Tyr Val Gln Asn Gly Ser Phe Lys Glu Ala Ser Val				
1585	1590	1595		1600
Ser Gln Ile Arg Ala Leu Leu Ala Asn Lys Val Asp Val Leu Cys Thr				
	1605	1610		1615
Val Asp Gly Val Asn Phe Arg Ser Cys Cys Val Ala Glu Gly Glu Val				
	1620	1625		1630
Phe Gly Lys Thr Leu Gly Ser Val Phe Cys Asp Gly Ile Asn Val Thr				
	1635	1640		1645
Lys Val Arg Cys Ser Ala Ile Tyr Lys Gly Lys Val Phe Phe Gln Tyr				
	1650	1655		1660
Ser Asp Leu Ser Glu Ala Asp Leu Val Ala Val Lys Asp Ala Phe Gly				
1665	1670	1675		1680
Phe Asp Glu Pro Gln Leu Leu Lys Tyr Tyr Thr Met Leu Gly Met Cys				
	1685	1690		1695
Lys Trp Pro Val Val Val Cys Gly Asn Tyr Phe Ala Phe Lys Gln Ser				
	1700	1705		1710
Asn Asn Asn Cys Tyr Ile Asn Val Ala Cys Leu Met Leu Gln His Leu				
	1715	1720		1725
Ser Leu Lys Phe Pro Lys Trp Gln Trp Gln Glu Ala Trp Asn Glu Phe				
	1730	1735		1740
Arg Ser Gly Lys Pro Leu Arg Phe Val Ser Leu Val Leu Ala Lys Gly				
1745	1750	1755		1760
Ser Phe Lys Phe Asn Glu Pro Ser Asp Ser Ile Asp Phe Met Arg Val				
	1765	1770		1775
Val Leu Arg Glu Ala Asp Leu Ser Gly Ala Thr Cys Asn Leu Glu Phe				
	1780	1785		1790
Val Cys Lys Cys Gly Val Lys Gln Glu Gln Arg Lys Gly Val Asp Ala				
	1795	1800		1805
Val Met His Phe Gly Thr Leu Asp Lys Gly Asp Leu Val Arg Gly Tyr				
	1810	1815		1820
Asn Ile Ala Cys Thr Cys Gly Ser Lys Leu Val His Cys Thr Gln Phe				

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1825                      1830                      1835                      1840  
 Asn Val Pro Phe Leu Ile Cys Ser Asn Thr Pro Glu Gly Arg Lys Leu  
                                  1845                      1850                      1855  
 Pro Asp Asp Val Val Ala Ala Asn Ile Phe Thr Gly Gly Ser Val Gly  
                                  1860                      1865                      1870  
 His Tyr Thr His Val Lys Cys Lys Pro Lys Tyr Gln Leu Tyr Asp Ala  
                                  1875                      1880                      1885  
 Cys Asn Val Asn Lys Val Ser Glu Ala Lys Gly Asn Phe Thr Asp Cys  
                                  1890                      1895                      1900  
 Leu Tyr Leu Lys Asn Leu Lys Gln Thr Phe Ser Ser Val Leu Thr Thr  
                                  1905                      1910                      1915                      1920  
 Phe Tyr Leu Asp Asp Val Lys Cys Val Glu Tyr Lys Pro Asp Leu Ser  
                                  1925                      1930                      1935  
 Gln Tyr Tyr Cys Glu Ser Gly Lys Tyr Tyr Thr Lys Pro Ile Ile Lys  
                                  1940                      1945                      1950  
 Ala Gln Phe Arg Thr Phe Glu Lys Val Asp Gly Val Tyr Thr Asn Phe  
                                  1955                      1960                      1965  
 Lys Leu Val Gly His Ser Ile Ala Glu Lys Leu Asn Ala Lys Leu Gly  
                                  1970                      1975                      1980  
 Phe Asp Cys Asn Ser Pro Phe Val Glu Tyr Lys Ile Thr Glu Trp Pro  
                                  1985                      1990                      1995                      2000  
 Thr Ala Thr Gly Asp Val Val Leu Ala Ser Asp Asp Leu Tyr Val Ser  
                                  2005                      2010                      2015  
 Arg Tyr Ser Ser Gly Cys Ile Thr Phe Gly Lys Pro Val Val Trp Leu  
                                  2020                      2025                      2030  
 Gly His Glu Glu Ala Ser Leu Lys Ser Leu Thr Tyr Phe Asn Arg Pro  
                                  2035                      2040                      2045  
 Ser Val Val Cys Glu Asn Lys Phe Asn Val Leu Pro Val Asp Val Ser  
                                  2050                      2055                      2060  
 Glu Pro Thr Asp Lys Gly Pro Val Pro Ala Ala Val Leu Val Thr Gly  
                                  2065                      2070                      2075                      2080  
 Val Pro Gly Ala Asp Ala Ser Ala Gly Ala Gly Ile Ala Lys Glu Gln  
                                  2085                      2090                      2095  
 Lys Ala Cys Ala Ser Ala Ser Val Glu Asp Gln Val Val Thr Glu Val  
                                  2100                      2105                      2110  
 Arg Gln Glu Pro Ser Val Ser Ala Ala Asp Val Lys Glu Val Lys Leu  
                                  2115                      2120                      2125  
 Asn Gly Val Lys Lys Pro Val Lys Val Glu Gly Ser Val Val Val Asn  
                                  2130                      2135                      2140  
 Asp Pro Thr Ser Glu Thr Lys Val Val Lys Ser Leu Ser Ile Val Asp  
                                  2145                      2150                      2155                      2160  
 Val Tyr Asp Met Phe Leu Thr Gly Cys Lys Tyr Val Val Trp Thr Ala

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2165 2170 2175

Asn Glu Leu Ser Arg Leu Val Asn Ser Pro Thr Val Arg Glu Tyr Val  
2180 2185 2190

Lys Trp Gly Met Gly Lys Ile Val Thr Pro Ala Lys Leu Leu Leu Leu  
2195 2200 2205

Arg Asp Glu Lys Gln Glu Phe Val Ala Pro Lys Val Val Lys Ala Lys  
2210 2215 2220

Ala Ile Ala Cys Tyr Cys Ala Val Lys Trp Phe Leu Leu Tyr Cys Phe  
2225 2230 2235 2240

Ser Trp Ile Lys Phe Asn Thr Asp Asn Lys Val Ile Tyr Thr Thr Glu  
2245 2250 2255

Val Ala Ser Lys Leu Thr Phe Lys Leu Cys Cys Leu Ala Phe Lys Asn  
2260 2265 2270

Ala Leu Gln Thr Phe Asn Trp Ser Val Val Ser Arg Gly Phe Phe Leu  
2275 2280 2285

Val Ala Thr Val Phe Leu Leu Trp Phe Asn Phe Leu Tyr Ala Asn Val  
2290 2295 2300

Ile Leu Ser Asp Phe Tyr Leu Pro Asn Ile Gly Pro Leu Pro Thr Phe  
2305 2310 2315 2320

Val Gly Gln Ile Val Ala Trp Phe Lys Thr Thr Phe Gly Val Ser Thr  
2325 2330 2335

Ile Cys Asp Phe Tyr Gln Val Thr Asp Leu Gly Tyr Arg Ser Ser Phe  
2340 2345 2350

Cys Asn Gly Ser Met Val Cys Glu Leu Cys Phe Ser Gly Phe Asp Met  
2355 2360 2365

Leu Asp Asn Tyr Asp Ala Ile Asn Val Val Gln His Val Val Asp Arg  
2370 2375 2380

Arg Leu Ser Phe Asp Tyr Ile Ser Leu Phe Lys Leu Val Val Glu Leu  
2385 2390 2395 2400

Val Ile Gly Tyr Ser Leu Tyr Thr Val Cys Phe Tyr Pro Leu Phe Val  
2405 2410 2415

Leu Ile Gly Met Gln Leu Leu Thr Thr Trp Leu Pro Glu Phe Phe Met  
2420 2425 2430

Leu Glu Thr Met His Trp Ser Ala Arg Leu Phe Val Phe Val Ala Asn  
2435 2440 2445

Met Leu Pro Ala Phe Thr Leu Leu Arg Phe Tyr Ile Val Val Thr Ala  
2450 2455 2460

Met Tyr Lys Val Tyr Cys Leu Cys Arg His Val Met Tyr Gly Cys Ser  
2465 2470 2475 2480

Lys Pro Gly Cys Leu Phe Cys Tyr Lys Arg Asn Arg Ser Val Arg Val  
2485 2490 2495

Lys Cys Ser Thr Val Val Gly Gly Ser Leu Arg Tyr Tyr Asp Val Met



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2500 2505 2510  
 Ala Asn Gly Gly Thr Gly Phe Cys Thr Lys His Gln Trp Asn Cys Leu  
 2515 2520 2525  
 Asn Cys Asn Ser Trp Lys Pro Gly Asn Thr Phe Ile Thr His Glu Ala  
 2530 2535 2540  
 Ala Ala Asp Leu Ser Lys Glu Leu Lys Arg Pro Val Asn Pro Thr Asp  
 2545 2550 2555 2560  
 Ser Ala Tyr Tyr Ser Val Thr Glu Val Lys Gln Val Gly Cys Ser Met  
 2565 2570 2575  
 Arg Leu Phe Tyr Glu Arg Asp Gly Gln Arg Val Tyr Asp Asp Val Asn  
 2580 2585 2590  
 Ala Ser Leu Phe Val Asp Met Asn Gly Leu Leu His Ser Lys Val Lys  
 2595 2600 2605  
 Gly Val Pro Glu Thr His Val Val Val Val Glu Asn Glu Ala Asp Lys  
 2610 2615 2620  
 Ala Gly Phe Leu Gly Ala Ala Val Phe Tyr Ala Gln Ser Leu Tyr Arg  
 2625 2630 2635 2640  
 Pro Met Leu Met Val Glu Lys Lys Leu Ile Thr Thr Ala Asn Thr Gly  
 2645 2650 2655  
 Leu Ser Val Ser Arg Thr Met Phe Asp Leu Tyr Val Asp Ser Leu Leu  
 2660 2665 2670  
 Asn Val Leu Asp Val Asp Arg Lys Ser Leu Thr Ser Phe Val Asn Ala  
 2675 2680 2685  
 Ala His Asn Ser Leu Lys Glu Gly Val Gln Leu Glu Gln Val Met Asp  
 2690 2695 2700  
 Thr Phe Ile Gly Cys Ala Arg Arg Lys Cys Ala Ile Asp Ser Asp Val  
 2705 2710 2715 2720  
 Glu Thr Lys Ser Ile Thr Lys Ser Val Met Ser Ala Val Asn Ala Gly  
 2725 2730 2735  
 Val Asp Phe Thr Asp Glu Ser Cys Asn Asn Leu Val Pro Thr Tyr Val  
 2740 2745 2750  
 Lys Ser Asp Thr Ile Val Ala Ala Asp Leu Gly Val Leu Ile Gln Asn  
 2755 2760 2765  
 Asn Ala Lys His Val Gln Ala Asn Val Ala Lys Ala Ala Asn Val Ala  
 2770 2775 2780  
 Cys Ile Trp Ser Val Asp Ala Phe Asn Gln Leu Ser Ala Asp Leu Gln  
 2785 2790 2795 2800  
 His Arg Leu Arg Lys Ala Cys Ser Lys Thr Gly Leu Lys Ile Lys Leu  
 2805 2810 2815  
 Thr Tyr Asn Lys Gln Glu Ala Asn Val Pro Ile Leu Thr Thr Pro Phe  
 2820 2825 2830  
 Ser Leu Lys Gly Gly Ala Val Phe Ser Arg Met Leu Gln Trp Leu Phe

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2835 2840 2845  
Val Ala Asn Leu Ile Cys Phe Ile Val Leu Trp Ala Leu Met Pro Thr  
2850 2855 2860  
Tyr Ala Val His Lys Ser Asp Met Gln Leu Pro Leu Tyr Ala Ser Phe  
2865 2870 2875 2880  
Lys Val Ile Asp Asn Gly Val Leu Arg Asp Val Ser Val Thr Asp Ala  
2885 2890 2895  
Cys Phe Ala Asn Lys Phe Asn Gln Phe Asp Gln Trp Tyr Glu Ser Thr  
2900 2905 2910  
Phe Gly Leu Ala Tyr Tyr Arg Asn Ser Lys Ala Cys Pro Val Val Val  
2915 2920 2925  
Ala Val Ile Asp Gln Asp Ile Gly His Thr Leu Phe Asn Val Pro Thr  
2930 2935 2940  
Thr Val Leu Arg Tyr Gly Phe His Val Leu His Phe Ile Thr His Ala  
2945 2950 2955 2960  
Phe Ala Thr Asp Ser Val Gln Cys Tyr Thr Pro His Met Gln Ile Pro  
2965 2970 2975  
Tyr Asp Asn Phe Tyr Ala Ser Gly Cys Val Leu Ser Ser Leu Cys Thr  
2980 2985 2990  
Met Leu Ala His Ala Asp Gly Thr Pro His Pro Tyr Cys Tyr Thr Gly  
2995 3000 3005  
Gly Val Met His Asn Ala Ser Leu Tyr Ser Ser Leu Ala Pro His Val  
3010 3015 3020  
Arg Tyr Asn Leu Ala Ser Ser Asn Gly Tyr Ile Arg Phe Pro Glu Val  
3025 3030 3035 3040  
Val Ser Glu Gly Ile Val Arg Val Val Arg Thr Arg Ser Met Thr Tyr  
3045 3050 3055  
Cys Arg Val Gly Leu Cys Glu Glu Ala Glu Glu Gly Ile Cys Phe Asn  
3060 3065 3070  
Phe Asn Arg Ser Trp Val Leu Asn Asn Pro Tyr Tyr Arg Ala Met Pro  
3075 3080 3085  
Gly Thr Phe Cys Gly Arg Asn Ala Phe Asp Leu Ile His Gln Val Leu  
3090 3095 3100  
Gly Gly Leu Val Arg Pro Ile Asp Phe Phe Ala Leu Thr Ala Ser Ser  
3105 3110 3115 3120  
Val Ala Gly Ala Ile Leu Ala Ile Ile Val Val Leu Ala Phe Tyr Tyr  
3125 3130 3135  
Leu Ile Lys Leu Lys Arg Ala Phe Gly Asp Tyr Thr Ser Val Val Val  
3140 3145 3150  
Ile Asn Val Ile Val Trp Cys Ile Asn Phe Leu Met Leu Phe Val Phe  
3155 3160 3165  
Gln Val Tyr Pro Thr Leu Ser Cys Leu Tyr Ala Cys Phe Tyr Phe Tyr

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3170 3175 3180  
 Thr Thr Leu Tyr Phe Pro Ser Glu Ile Ser Val Val Met His Leu Gln  
 3185 3190 3195 3200  
 Trp Leu Val Met Tyr Gly Ala Ile Met Pro Leu Trp Phe Cys Ile Ile  
 3205 3210 3215  
 Tyr Val Ala Val Val Val Ser Asn His Ala Leu Trp Leu Phe Ser Tyr  
 3220 3225 3230  
 Cys Arg Lys Ile Gly Thr Glu Val Arg Ser Asp Gly Thr Phe Glu Glu  
 3235 3240 3245  
 Met Ala Leu Thr Thr Phe Met Ile Thr Lys Glu Ser Tyr Cys Lys Leu  
 3250 3255 3260  
 Lys Asn Ser Val Ser Asp Val Ala Phe Asn Arg Tyr Leu Ser Leu Tyr  
 3265 3270 3275 3280  
 Asn Lys Tyr Arg Tyr Phe Ser Gly Lys Met Asp Thr Ala Ala Tyr Arg  
 3285 3290 3295  
 Glu Ala Ala Cys Ser Gln Leu Ala Lys Ala Met Glu Thr Phe Asn His  
 3300 3305 3310  
 Asn Asn Gly Asn Asp Val Leu Tyr Gln Pro Pro Thr Ala Ser Val Thr  
 3315 3320 3325  
 Thr Ser Phe Leu Gln Ser Gly Ile Val Lys Met Val Ser Pro Thr Ser  
 3330 3335 3340  
 Lys Val Glu Pro Cys Ile Val Ser Val Thr Tyr Gly Asn Met Thr Leu  
 3345 3350 3355 3360  
 Asn Gly Leu Trp Leu Asp Asp Lys Val Tyr Cys Pro Arg His Val Ile  
 3365 3370 3375  
 Cys Ser Ser Ala Asp Met Thr Asp Pro Asp Tyr Pro Asn Leu Leu Cys  
 3380 3385 3390  
 Arg Val Thr Ser Ser Asp Phe Cys Val Met Ser Gly Arg Met Ser Leu  
 3395 3400 3405  
 Thr Val Met Ser Tyr Gln Met Gln Gly Cys Gln Leu Val Leu Thr Val  
 3410 3415 3420  
 Thr Leu Gln Asn Pro Asn Thr Pro Lys Tyr Ser Phe Gly Val Val Lys  
 3425 3430 3435 3440  
 Pro Gly Glu Thr Phe Thr Val Leu Ala Ala Tyr Asn Gly Arg Pro Gln  
 3445 3450 3455  
 Gly Ala Phe His Val Thr Leu Arg Ser Ser His Thr Ile Lys Gly Ser  
 3460 3465 3470  
 Phe Leu Cys Gly Ser Cys Gly Ser Val Gly Tyr Val Leu Thr Gly Asp  
 3475 3480 3485  
 Ser Val Arg Phe Val Tyr Met His Gln Leu Glu Leu Ser Thr Gly Cys  
 3490 3495 3500  
 His Thr Gly Thr Asp Phe Ser Gly Asn Phe Tyr Gly Pro Tyr Arg Asp

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3505                      3510                      3515                      3520

Ala Gln Val Val Gln Leu Pro Val Gln Asp Tyr Thr Gln Thr Val Asn  
                                  3525                      3530                      3535

Val Val Ala Trp Leu Tyr Ala Ala Ile Phe Asn Arg Cys Asn Trp Phe  
                                  3540                      3545                      3550

Val Gln Ser Asp Ser Cys Ser Leu Glu Glu Phe Asn Val Trp Ala Met  
                                  3555                      3560                      3565

Thr Asn Gly Phe Ser Ser Ile Lys Ala Asp Leu Val Leu Asp Ala Leu  
                                  3570                      3575                      3580

Ala Ser Met Thr Gly Val Thr Val Glu Gln Val Leu Ala Ala Ile Lys  
                                  3585                      3590                      3595                      3600

Arg Leu His Ser Gly Phe Gln Gly Lys Gln Ile Leu Gly Ser Cys Val  
                                  3605                      3610                      3615

Leu Glu Asp Glu Thr Pro Ser Asp Val Tyr Gln Gln Leu Ala Gly Val  
                                  3620                      3625                      3630

Lys Leu Gln Ser Lys Arg Thr Arg Val Ile Lys Gly Thr Cys Cys Trp  
                                  3635                      3640                      3645

Ile Leu Ala Ser Thr Phe Leu Phe Cys Ser Ile Ile Ser Ala Phe Val  
                                  3650                      3655                      3660

Lys Trp Thr Met Phe Met Tyr Val Thr Thr His Met Leu Gly Val Thr  
                                  3665                      3670                      3675                      3680

Leu Cys Ala Leu Cys Phe Val Ser Phe Ala Met Leu Leu Ile Lys His  
                                  3685                      3690                      3695

Lys His Leu Tyr Leu Thr Met Tyr Ile Met Pro Val Leu Cys Thr Phe  
                                  3700                      3705                      3710

Tyr Thr Asn Tyr Leu Val Val Tyr Lys Gln Ser Phe Arg Gly Leu Ala  
                                  3715                      3720                      3725

Tyr Ala Trp Leu Ser His Phe Val Pro Ala Val Asp Tyr Thr Tyr Met  
                                  3730                      3735                      3740

Asp Glu Val Leu Tyr Gly Val Val Leu Leu Val Ala Met Val Phe Val  
                                  3745                      3750                      3755                      3760

Thr Met Arg Ser Ile Asn His Asp Val Phe Ser Ile Met Phe Leu Val  
                                  3765                      3770                      3775

Gly Arg Leu Val Ser Leu Val Ser Met Trp Tyr Phe Gly Ala Asn Leu  
                                  3780                      3785                      3790

Glu Glu Glu Val Leu Leu Phe Leu Thr Ser Leu Phe Gly Thr Tyr Thr  
                                  3795                      3800                      3805

Trp Thr Thr Met Leu Ser Leu Ala Thr Ala Lys Val Ile Ala Lys Trp  
                                  3810                      3815                      3820

Leu Ala Val Asn Val Leu Tyr Phe Thr Asp Val Pro Gln Ile Lys Leu  
                                  3825                      3830                      3835                      3840

Val Leu Leu Ser Tyr Leu Cys Ile Gly Tyr Val Cys Cys Cys Tyr Trp

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3845  
 Gly Ile Leu Ser Leu Leu Asn Ser Ile Phe Arg Met Pro Leu Gly Val  
 3860 3865 3870  
 Tyr Asn Tyr Lys Ile Ser Val Gln Glu Leu Arg Tyr Met Asn Ala Asn  
 3875 3880 3885  
 Gly Leu Arg Pro Pro Arg Asn Ser Phe Glu Ala Leu Met Leu Asn Phe  
 3890 3895 3900  
 Lys Leu Leu Gly Ile Gly Gly Val Pro Val Ile Glu Val Ser Gln Ile  
 3905 3910 3915 3920  
 Gln Ser Arg Leu Thr Asp Val Lys Cys Ala Asn Val Val Leu Leu Asn  
 3925 3930 3935  
 Cys Leu Gln His Leu His Ile Ala Ser Asn Ser Lys Leu Trp Gln Tyr  
 3940 3945 3950  
 Cys Ser Thr Leu His Asn Glu Ile Leu Ala Thr Ser Asp Leu Ser Met  
 3955 3960 3965  
 Ala Phe Asp Lys Leu Ala Gln Leu Leu Val Val Leu Phe Ala Asn Pro  
 3970 3975 3980  
 Ala Ala Val Asp Ser Lys Cys Leu Ala Ser Ile Glu Glu Val Ser Asp  
 3985 3990 3995 4000  
 Asp Tyr Val Arg Asp Asn Thr Val Leu Gln Ala Leu Gln Ser Glu Phe  
 4005 4010 4015  
 Val Asn Met Ala Ser Phe Val Glu Tyr Glu Leu Ala Lys Lys Asn Leu  
 4020 4025 4030  
 Asp Glu Ala Lys Ala Ser Gly Ser Ala Asn Gln Gln Gln Ile Lys Gln  
 4035 4040 4045  
 Leu Glu Lys Ala Cys Asn Ile Ala Lys Ser Ala Tyr Glu Arg Asp Arg  
 4050 4055 4060  
 Ala Val Ala Arg Lys Leu Glu Arg Met Ala Asp Leu Ala Leu Thr Asn  
 4065 4070 4075 4080  
 Met Tyr Lys Glu Ala Arg Ile Asn Asp Lys Lys Ser Lys Val Val Ser  
 4085 4090 4095  
 Ala Leu Gln Thr Met Leu Phe Ser Met Val Arg Lys Leu Asp Asn Gln  
 4100 4105 4110  
 Ala Leu Asn Ser Ile Leu Asp Asn Ala Val Lys Gly Cys Val Pro Leu  
 4115 4120 4125  
 Asn Ala Ile Pro Ser Leu Thr Ser Asn Thr Leu Thr Ile Ile Val Pro  
 4130 4135 4140  
 Asp Lys Gln Val Phe Asp Gln Val Val Asp Asn Val Tyr Val Thr Tyr  
 4145 4150 4155 4160  
 Ala Gly Asn Val Trp His Ile Gln Phe Ile Gln Asp Ala Asp Gly Ala  
 4165 4170 4175  
 Val Lys Gln Leu Asn Glu Ile Asp Val Asn Ser Thr Trp Pro Leu Val

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4180

4185

4190

Ile Ala Ala Asn Arg His Asn Glu Val Ser Thr Val Val Leu Gln Asn  
4195 4200 4205  
Asn Glu Leu Met Pro Gln Lys Leu Arg Thr Gln Val Val Asn Ser Gly  
4210 4215 4220  
Ser Asp Met Asn Cys Asn Thr Pro Thr Gln Cys Tyr Tyr Asn Thr Thr  
4225 4230 4235 4240  
Gly Thr Gly Lys Ile Val Tyr Ala Ile Leu Ser Asp Cys Asp Gly Leu  
4245 4250 4255  
Lys Tyr Thr Lys Ile Val Lys Glu Asp Gly Asn Cys Val Val Leu Glu  
4260 4265 4270  
Leu Asp Pro Pro Cys Lys Phe Ser Val Gln Asp Val Lys Gly Leu Lys  
4275 4280 4285  
Ile Lys Tyr Leu Tyr Phe Val Lys Gly Cys Asn Thr Leu Ala Arg Gly  
4290 4295 4300  
Trp Val Val Gly Thr Leu Ser Ser Thr Val Arg Leu Gln Ala Gly Thr  
4305 4310 4315 4320  
Ala Thr Glu Tyr Ala Ser Asn Ser Ala Ile Leu Ser Leu Cys Ala Phe  
4325 4330 4335  
Ser Val Asp Pro Lys Lys Thr Tyr Leu Asp Tyr Ile Lys Gln Gly Gly  
4340 4345 4350  
Val Pro Val Thr Asn Cys Val Lys Met Leu Cys Asp His Ala Gly Thr  
4355 4360 4365  
Gly Met Ala Ile Thr Ile Lys Pro Glu Ala Thr Thr Asn Gln Asp Ser  
4370 4375 4380  
Tyr Gly Gly Ala Ser Val Cys Ile Tyr Cys Arg Ser Arg Val Glu His  
4385 4390 4395 4400  
Pro Asp Val Asp Gly Leu Cys Lys Leu Arg Gly Lys Phe Val Gln Val  
4405 4410 4415  
Pro Leu Gly Ile Lys Asp Pro Val Ser Tyr Val Leu Thr His Asp Val  
4420 4425 4430  
Cys Gln Val Cys Gly Phe Trp Arg Asp Gly Ser Cys Ser Cys Val Gly  
4435 4440 4445  
Thr Gly Ser Gln Phe Gln Ser Lys Asp Thr Asn Phe Leu Asn Arg Ile  
4450 4455 4460  
Arg Gly Thr Ser Val Asn Ala Arg Leu Val Pro Cys Ala Ser Gly Leu  
4465 4470 4475 4480  
Asp Thr Asp Val Gln Leu Arg Ala Phe Asp Ile Cys Asn Ala Asn Arg  
4485 4490 4495  
Ala Gly Ile Gly Leu Tyr Tyr Lys Val Asn Cys Cys Arg Phe Gln Arg  
4500 4505 4510  
Val Asp Glu Asp Gly Asn Lys Leu Asp Lys Phe Phe Val Val Lys Arg

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4515                      4520                      4525  
 Thr Asn Leu Glu Val Tyr Asn Lys Glu Lys Glu Cys Tyr Glu Leu Thr  
 4530                      4535                      4540  
 Lys Glu Cys Gly Val Val Ala Glu His Glu Phe Phe Thr Phe Asp Val  
 4545                      4550                      4555                      4560  
 Glu Gly Ser Arg Val Pro His Ile Val Arg Lys Asp Leu Ser Lys Phe  
 4565                      4570                      4575  
 Thr Met Leu Asp Leu Cys Tyr Ala Leu Arg His Phe Asp Arg Asn Asp  
 4580                      4585                      4590  
 Cys Ser Thr Leu Lys Glu Ile Leu Leu Thr Tyr Ala Glu Cys Glu Glu  
 4595                      4600                      4605  
 Ser Tyr Phe Gln Lys Lys Asp Trp Tyr Asp Phe Val Glu Asn Pro Asp  
 4610                      4615                      4620  
 Ile Ile Asn Val Tyr Lys Lys Leu Gly Pro Ile Phe Asn Arg Ala Leu  
 4625                      4630                      4635                      4640  
 Leu Asn Thr Ala Lys Phe Ala Asp Ala Leu Val Glu Ala Gly Leu Val  
 4645                      4650                      4655  
 Gly Val Leu Thr Leu Asp Asn Gln Asp Leu Tyr Gly Gln Trp Tyr Asp  
 4660                      4665                      4670  
 Phe Gly Asp Phe Val Lys Thr Val Pro Gly Cys Gly Val Ala Val Ala  
 4675                      4680                      4685  
 Asp Ser Tyr Tyr Ser Tyr Met Met Pro Met Leu Thr Met Cys His Ala  
 4690                      4695                      4700  
 Leu Asp Ser Glu Leu Phe Val Asn Gly Thr Tyr Arg Glu Phe Asp Leu  
 4705                      4710                      4715                      4720  
 Val Gln Tyr Asp Phe Thr Asp Phe Lys Leu Glu Leu Phe Thr Lys Tyr  
 4725                      4730                      4735  
 Phe Lys His Trp Ser Met Thr Tyr His Pro Asn Thr Cys Glu Cys Glu  
 4740                      4745                      4750  
 Asp Asp Arg Cys Ile Ile His Cys Ala Asn Phe Asn Ile Leu Phe Ser  
 4755                      4760                      4765  
 Met Val Leu Pro Lys Thr Cys Phe Gly Pro Leu Val Arg Gln Ile Phe  
 4770                      4775                      4780  
 Val Asp Gly Val Pro Phe Val Val Ser Ile Gly Tyr His Tyr Lys Glu  
 4785                      4790                      4795                      4800  
 Leu Gly Val Val Met Asn Met Asp Val Asp Thr His Arg Tyr Arg Leu  
 4805                      4810                      4815  
 Ser Leu Lys Asp Leu Leu Leu Tyr Ala Ala Asp Pro Ala Leu His Val  
 4820                      4825                      4830  
 Ala Ser Ala Ser Ala Leu Leu Asp Leu Arg Thr Cys Cys Phe Ser Val  
 4835                      4840                      4845  
 Ala Ala Ile Thr Ser Gly Val Lys Phe Gln Thr Val Lys Pro Gly Asn

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4850                      4855                      4860  
 Phe Asn Gln Asp Phe Tyr Glu Phe Ile Leu Ser Lys Gly Leu Leu Lys  
 4865                      4870                      4875                      4880  
 Glu Gly Ser Ser Val Asp Leu Lys His Phe Phe Phe Thr Gln Asp Gly  
                                  4885                      4890                      4895  
 Asn Ala Ala Ile Thr Asp Tyr Asn Tyr Tyr Lys Tyr Asn Leu Pro Thr  
                                  4900                      4905                      4910  
 Met Val Asp Ile Lys Gln Leu Leu Phe Val Leu Glu Val Val Asn Lys  
                                  4915                      4920                      4925  
 Tyr Phe Glu Ile Tyr Glu Gly Gly Cys Ile Pro Ala Thr Gln Val Ile  
                                  4930                      4935                      4940  
 Val Asn Asn Tyr Asp Lys Ser Ala Gly Tyr Pro Phe Asn Lys Phe Gly  
 4945                      4950                      4955                      4960  
 Lys Ala Arg Leu Tyr Tyr Glu Ala Leu Ser Phe Glu Glu Gln Asp Glu  
                                  4965                      4970                      4975  
 Ile Tyr Ala Tyr Thr Lys Arg Asn Val Leu Pro Thr Leu Thr Gln Met  
                                  4980                      4985                      4990  
 Asn Leu Lys Tyr Ala Ile Ser Ala Lys Asn Arg Ala Arg Thr Val Ala  
                                  4995                      5000                      5005  
 Gly Val Ser Ile Leu Ser Thr Met Thr Gly Arg Met Phe His Gln Lys  
                                  5010                      5015                      5020  
 Cys Leu Lys Ser Ile Ala Ala Thr Arg Gly Val Pro Val Val Ile Gly  
 5025                      5030                      5035                      5040  
 Thr Thr Lys Phe Tyr Gly Gly Trp Asp Asp Met Leu Arg Arg Leu Ile  
                                  5045                      5050                      5055  
 Lys Asp Val Asp Ser Pro Val Leu Met Gly Trp Asp Tyr Pro Lys Cys  
                                  5060                      5065                      5070  
 Asp Arg Ala Met Pro Asn Ile Leu Arg Ile Val Ser Ser Leu Val Leu  
                                  5075                      5080                      5085  
 Ala Arg Lys His Asp Ser Cys Cys Ser His Thr Asp Arg Phe Tyr Arg  
                                  5090                      5095                      5100  
 Leu Ala Asn Glu Cys Ala Gln Val Leu Ser Glu Ile Val Met Cys Gly  
 5105                      5110                      5115                      5120  
 Gly Cys Tyr Tyr Val Lys Pro Gly Gly Thr Ser Ser Gly Asp Ala Thr  
                                  5125                      5130                      5135  
 Thr Ala Phe Ala Asn Ser Val Phe Asn Ile Cys Gln Ala Val Ser Ala  
                                  5140                      5145                      5150  
 Asn Val Cys Ser Leu Met Ala Cys Asn Gly His Lys Ile Glu Asp Leu  
                                  5155                      5160                      5165  
 Ser Ile Arg Glu Leu Gln Lys Arg Leu Tyr Ser Asn Val Tyr Arg Ala  
                                  5170                      5175                      5180  
 Asp His Val Asp Pro Ala Phe Val Ser Glu Tyr Tyr Glu Phe Leu Asn



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5185                      5190                      5195                      5200  
 Lys His Phe Ser Met Met Ile Leu Ser Asp Asp Gly Val Val Cys Tyr  
                                  5205                                   5210                                   5215  
 Asn Ser Glu Phe Ala Ser Lys Gly Tyr Ile Ala Asn Ile Ser Ala Phe  
                                  5220                                   5225                                   5230  
 Gln Gln Val Leu Tyr Tyr Gln Asn Asn Val Phe Met Ser Glu Ala Lys  
                                  5235                                   5240                                   5245  
 Cys Trp Val Glu Thr Asp Ile Glu Lys Gly Pro His Glu Phe Cys Ser  
                                  5250                                   5255                                   5260  
 Gln His Thr Met Leu Val Lys Met Asp Gly Asp Glu Val Tyr Leu Pro  
                                  5265                                   5270                                   5275                                   5280  
 Tyr Pro Asp Pro Ser Arg Ile Leu Gly Ala Gly Cys Phe Val Asp Asp  
                                  5285                                   5290                                   5295  
 Leu Leu Lys Thr Asp Ser Val Leu Leu Ile Glu Arg Phe Val Ser Leu  
                                  5300                                   5305                                   5310  
 Ala Ile Asp Ala Tyr Pro Leu Val Tyr His Glu Asn Pro Glu Tyr Gln  
                                  5315                                   5320                                   5325  
 Asn Val Phe Arg Val Tyr Leu Glu Tyr Ile Lys Lys Leu Tyr Asn Asp  
                                  5330                                   5335                                   5340  
 Leu Gly Asn Gln Ile Leu Asp Ser Tyr Ser Val Ile Leu Ser Thr Cys  
                                  5345                                   5350                                   5355                                   5360  
 Asp Gly Gln Lys Phe Thr Asp Glu Thr Phe Tyr Lys Asn Met Tyr Leu  
                                  5365                                   5370                                   5375  
 Arg Ser Ala Val Leu Gln Ser Val Gly Ala Cys Val Val Cys Ser Ser  
                                  5380                                   5385                                   5390  
 Gln Thr Ser Leu Arg Cys Gly Ser Cys Ile Arg Lys Pro Leu Leu Cys  
                                  5395                                   5400                                   5405  
 Cys Lys Cys Ala Tyr Asp His Val Met Ser Thr Asp His Lys Tyr Val  
                                  5410                                   5415                                   5420  
 Leu Ser Val Ser Pro Tyr Val Cys Asn Ser Pro Gly Cys Asp Val Asn  
                                  5425                                   5430                                   5435                                   5440  
 Asp Val Thr Lys Leu Tyr Leu Gly Gly Met Ser Tyr Tyr Cys Glu Asp  
                                  5445                                   5450                                   5455  
 His Lys Pro Gln Tyr Ser Phe Lys Leu Val Met Asn Gly Met Val Phe  
                                  5460                                   5465                                   5470  
 Gly Leu Tyr Lys Gln Ser Cys Thr Gly Ser Pro Tyr Ile Glu Asp Phe  
                                  5475                                   5480                                   5485  
 Asn Lys Ile Ala Ser Cys Lys Trp Thr Glu Val Asp Asp Tyr Val Leu  
                                  5490                                   5495                                   5500  
 Ala Asn Glu Cys Thr Glu Arg Leu Lys Leu Phe Ala Ala Glu Thr Gln  
                                  5505                                   5510                                   5515                                   5520  
 Lys Ala Thr Glu Glu Ala Phe Lys Gln Cys Tyr Ala Ser Ala Thr Ile

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5525  
 Arg Glu Ile Val Ser Asp Arg Glu Leu Ile Leu Ser Trp Glu Ile Gly  
 5540 5545 5550  
 Lys Val Arg Pro Pro Leu Asn Lys Asn Tyr Val Phe Thr Gly Tyr His  
 5555 5560 5565  
 Phe Thr Asn Asn Gly Lys Thr Val Leu Gly Glu Tyr Val Phe Asp Lys  
 5570 5575 5580  
 Ser Glu Leu Thr Asn Gly Val Tyr Tyr Arg Ala Thr Thr Thr Tyr Lys  
 5585 5590 5595 5600  
 Leu Ser Val Gly Asp Val Phe Ile Leu Thr Ser His Ala Val Ser Ser  
 5605 5610 5615  
 Leu Ser Ala Pro Thr Leu Val Pro Gln Glu Asn Tyr Thr Ser Ile Arg  
 5620 5625 5630  
 Phe Ala Ser Val Tyr Ser Val Pro Glu Thr Phe Gln Asn Asn Val Pro  
 5635 5640 5645  
 Asn Tyr Gln His Ile Gly Met Lys Arg Tyr Cys Thr Val Gln Gly Pro  
 5650 5655 5660  
 Pro Gly Thr Gly Lys Ser His Leu Ala Ile Gly Leu Ala Val Tyr Tyr  
 5665 5670 5675 5680  
 Cys Thr Ala Arg Val Val Tyr Thr Ala Ala Ser His Ala Ala Val Asp  
 5685 5690 5695  
 Ala Leu Cys Glu Lys Ala His Lys Phe Leu Asn Ile Asn Asp Cys Thr  
 5700 5705 5710  
 Arg Ile Val Pro Ala Lys Val Arg Val Asp Cys Tyr Asp Lys Phe Lys  
 5715 5720 5725  
 Val Asn Asp Thr Thr Arg Lys Tyr Val Phe Thr Thr Ile Asn Ala Leu  
 5730 5735 5740  
 Pro Glu Leu Val Thr Asp Ile Ile Val Val Asp Glu Val Ser Met Leu  
 5745 5750 5755 5760  
 Thr Asn Tyr Glu Leu Ser Val Ile Asn Ser Arg Val Arg Ala Lys His  
 5765 5770 5775  
 Tyr Val Tyr Ile Gly Asp Pro Ala Gln Leu Pro Ala Pro Arg Val Leu  
 5780 5785 5790  
 Leu Asn Lys Gly Thr Leu Glu Pro Arg Tyr Phe Asn Ser Val Thr Lys  
 5795 5800 5805  
 Leu Met Cys Cys Leu Gly Pro Asp Ile Phe Leu Gly Thr Cys Tyr Arg  
 5810 5815 5820  
 Cys Pro Lys Glu Ile Val Asp Thr Val Ser Ala Leu Val Tyr Asn Asn  
 5825 5830 5835 5840  
 Lys Leu Lys Ala Lys Asn Asp Asn Ser Ser Met Cys Phe Lys Val Tyr  
 5845 5850 5855  
 Tyr Lys Gly Gln Thr Thr His Glu Ser Ser Ser Ala Val Asn Met Gln

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5860 5865 5870  
 Gln Ile His Leu Ile Ser Lys Phe Leu Lys Ala Asn Pro Ser Trp Ser  
           5875                                  5880                  5885  
 Asn Ala Val Phe Ile Ser Pro Tyr Asn Ser Gln Asn Tyr Val Ala Lys  
           5890                                  5895                  5900  
 Arg Val Leu Gly Leu Gln Thr Gln Thr Val Asp Ser Ala Gln Gly Ser  
           5905                                  5910                  5915                  5920  
 Glu Tyr Asp Phe Val Ile Tyr Ser Gln Thr Ala Glu Thr Ala His Ser  
                                   5925                                  5930                                  5935  
 Val Asn Val Asn Arg Phe Asn Val Ala Ile Thr Arg Ala Lys Lys Gly  
                                   5940                                  5945                                  5950  
 Ile Leu Cys Val Met Ser Ser Met Gln Leu Phe Glu Ser Leu Asn Phe  
                                   5955                                  5960                                  5965  
 Thr Thr Leu Thr Leu Asp Lys Ile Asn Asn Pro Arg Leu Gln Cys Thr  
                                   5970                                  5975                                  5980  
 Thr Asn Leu Phe Lys Asp Cys Ser Arg Ser Tyr Val Gly Tyr His Pro  
           5985                                  5990                                  5995                                  6000  
 Ala His Ala Pro Ser Phe Leu Ala Val Asp Asp Lys Tyr Lys Val Gly  
                                   6005                                  6010                                  6015  
 Gly Asp Leu Ala Val Cys Leu Asn Val Ala Asp Ser Ala Val Thr Tyr  
                                   6020                                  6025                                  6030  
 Ser Arg Leu Ile Ser Leu Met Gly Phe Lys Leu Asp Leu Thr Leu Asp  
                                   6035                                  6040                                  6045  
 Gly Tyr Cys Lys Leu Phe Ile Thr Arg Asp Glu Ala Ile Lys Arg Val  
                                   6050                                  6055                                  6060  
 Arg Ala Trp Val Gly Phe Asp Ala Glu Gly Ala His Ala Ile Arg Asp  
           6065                                  6070                                  6075                                  6080  
 Ser Ile Gly Thr Asn Phe Pro Leu Gln Leu Gly Phe Ser Thr Gly Ile  
                                   6085                                  6090                                  6095  
 Asp Phe Val Val Glu Ala Thr Gly Met Phe Ala Glu Arg Asp Gly Tyr  
                                   6100                                  6105                                  6110  
 Val Phe Lys Lys Ala Ala Ala Arg Ala Pro Pro Gly Glu Gln Phe Lys  
                                   6115                                  6120                                  6125  
 His Leu Ile Pro Leu Met Ser Arg Gly Gln Lys Trp Asp Val Val Arg  
           6130                                  6135                                  6140  
 Ile Arg Ile Val Gln Met Leu Ser Asp His Leu Val Asp Leu Ala Asp  
           6145                                  6150                                  6155                                  6160  
 Ser Val Val Leu Val Thr Trp Ala Ala Ser Phe Glu Leu Thr Cys Leu  
                                   6165                                  6170                                  6175  
 Arg Tyr Phe Ala Lys Val Gly Arg Glu Val Val Cys Ser Val Cys Thr  
                                   6180                                  6185                                  6190  
 Lys Arg Ala Thr Cys Phe Asn Ser Arg Thr Gly Tyr Tyr Gly Cys Trp

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6195                      6200                      6205  
 Arg His Ser Tyr Ser Cys Asp Tyr Leu Tyr Asn Pro Leu Ile Val Asp  
   6210                      6215                      6220  
 Ile Gln Gln Trp Gly Tyr Thr Gly Ser Leu Thr Ser Asn His Asp Pro  
   6225                      6230                      6235                      6240  
 Ile Cys Ser Val His Lys Gly Ala His Val Ala Ser Ser Asp Ala Ile  
                           6245                      6250                      6255  
 Met Thr Arg Cys Leu Ala Val His Asp Cys Phe Cys Lys Ser Val Asn  
                           6260                      6265                      6270  
 Trp Asn Leu Glu Tyr Pro Ile Ile Ser Asn Glu Val Ser Val Asn Thr  
                           6275                      6280                      6285  
 Ser Cys Arg Leu Leu Gln Arg Val Met Phe Arg Ala Ala Met Leu Cys  
                           6290                      6295                      6300  
 Asn Arg Tyr Asp Val Cys Tyr Asp Ile Gly Asn Pro Lys Gly Leu Ala  
   6305                      6310                      6315                      6320  
 Cys Val Lys Gly Tyr Asp Phe Lys Phe Tyr Asp Ala Ser Pro Val Val  
                           6325                      6330                      6335  
 Lys Ser Val Lys Gln Phe Val Tyr Lys Tyr Glu Ala His Lys Asp Gln  
                           6340                      6345                      6350  
 Phe Leu Asp Gly Leu Cys Met Phe Trp Asn Cys Asn Val Asp Lys Tyr  
                           6355                      6360                      6365  
 Pro Ala Asn Ala Val Val Cys Arg Phe Asp Thr Arg Val Leu Asn Lys  
                           6370                      6375                      6380  
 Leu Asn Leu Pro Gly Cys Asn Gly Gly Ser Leu Tyr Val Asn Lys His  
   6385                      6390                      6395                      6400  
 Ala Phe His Thr Ser Pro Phe Thr Arg Ala Ala Phe Glu Asn Leu Lys  
                           6405                      6410                      6415  
 Pro Met Pro Phe Phe Tyr Tyr Ser Asp Thr Pro Cys Val Tyr Met Glu  
                           6420                      6425                      6430  
 Gly Met Glu Ser Lys Gln Val Asp Tyr Val Pro Leu Arg Ser Ala Thr  
                           6435                      6440                      6445  
 Cys Ile Thr Arg Cys Asn Leu Gly Gly Ala Val Cys Leu Lys His Ala  
   6450                      6455                      6460  
 Glu Glu Tyr Arg Glu Tyr Leu Glu Ser Tyr Asn Thr Ala Thr Thr Ala  
   6465                      6470                      6475                      6480  
 Gly Phe Thr Phe Trp Val Tyr Lys Thr Phe Asp Phe Tyr Asn Leu Trp  
                           6485                      6490                      6495  
 Asn Thr Phe Thr Arg Leu Gln Ser Leu Glu Asn Val Val Tyr Asn Leu  
                           6500                      6505                      6510  
 Val Asn Ala Gly His Phe Asp Gly Arg Ala Gly Glu Leu Pro Cys Ala  
                           6515                      6520                      6525  
 Val Ile Gly Glu Lys Val Ile Ala Lys Ile Gln Asn Glu Asp Val Val

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6540

6530	6535	
Val Phe Lys Asn Asn Thr Pro Phe Pro Thr Asn Val Ala Val Glu Leu		
6545	6550	6555 6560
Phe Ala Lys Arg Ser Ile Arg Pro His Pro Glu Leu Lys Leu Phe Arg		
	6565	6570 6575
Asn Leu Asn Ile Asp Val Cys Trp Ser His Val Leu Trp Asp Tyr Ala		
	6580	6585 6590
Lys Asp Ser Val Phe Cys Ser Ser Thr Tyr Lys Val Cys Lys Tyr Thr		
	6595	6600 6605
Asp Leu Gln Cys Ile Glu Ser Leu Asn Val Leu Phe Asp Gly Arg Asp		
	6610	6615 6620
Asn Gly Ala Leu Glu Ala Phe Lys Lys Cys Arg Asn Gly Val Tyr Ile		
	6625	6630 6635 6640
Asn Thr Thr Lys Ile Lys Ser Leu Ser Met Ile Lys Gly Pro Gln Arg		
	6645	6650 6655
Ala Asp Leu Asn Gly Val Val Val Glu Lys Val Gly Asp Ser Asp Val		
	6660	6665 6670
Glu Phe Trp Phe Ala Val Arg Lys Asp Gly Asp Asp Val Ile Phe Ser		
	6675	6680 6685
Arg Thr Gly Ser Leu Glu Pro Ser His Tyr Arg Ser Pro Gln Gly Asn		
	6690	6695 6700
Pro Gly Gly Asn Arg Val Gly Asp Leu Ser Gly Asn Glu Ala Leu Ala		
	6705	6710 6715 6720
Arg Gly Thr Ile Phe Thr Gln Ser Arg Leu Leu Ser Ser Phe Thr Pro		
	6725	6730 6735
Arg Ser Glu Met Glu Lys Asp Phe Met Asp Leu Asp Asp Asp Val Phe		
	6740	6745 6750
Ile Ala Lys Tyr Ser Leu Gln Asp Tyr Ala Phe Glu His Val Val Tyr		
	6755	6760 6765
Gly Ser Phe Asn Gln Lys Ile Ile Gly Gly Leu His Leu Leu Ile Gly		
	6770	6775 6780
Leu Ala Arg Arg Gln Gln Lys Ser Asn Leu Val Ile Gln Glu Phe Val		
	6785	6790 6795 6800
Thr Tyr Asp Ser Ser Ile His Ser Tyr Phe Ile Thr Asp Glu Asn Ser		
	6805	6810 6815
Gly Ser Ser Lys Ser Val Cys Thr Val Ile Asp Leu Leu Leu Asp Asp		
	6820	6825 6830
Phe Val Asp Ile Val Lys Ser Leu Asn Leu Lys Cys Val Ser Lys Val		
	6835	6840 6845
Val Asn Val Asn Val Asp Phe Lys Asp Phe Gln Phe Met Leu Trp Cys		
	6850	6855 6860
Asn Glu Glu Lys Val Met Thr Phe Tyr Pro Arg Leu Gln Ala Ala Ala		

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6865          6870          6875          6880
Asp Trp Lys Pro Gly Tyr Val Met Pro Val Leu Tyr Lys Tyr Leu Glu
6885          6890          6895
Ser Pro Leu Glu Arg Val Asn Leu Trp Asn Tyr Gly Lys Pro Ile Thr
6900          6905          6910
Leu Pro Thr Gly Cys Met Met Asn Val Ala Lys Tyr Thr Gln Leu Cys
6915          6920          6925
Gln Tyr Leu Ser Thr Thr Thr Leu Ala Val Pro Ala Asn Met Arg Val
6930          6935          6940
Leu His Leu Gly Ala Gly Ser Asp Lys Gly Val Ala Pro Gly Ser Ala
6945          6950          6955          6960
Val Leu Arg Gln Trp Leu Pro Ala Gly Ser Ile Leu Val Asp Asn Asp
6965          6970          6975
Val Asn Pro Phe Val Ser Asp Ser Val Ala Ser Tyr Tyr Gly Asn Cys
6980          6985          6990
Ile Thr Leu Pro Phe Asp Cys Gln Trp Asp Leu Ile Ile Ser Asp Met
6995          7000          7005
Tyr Asp Pro Leu Thr Lys Asn Ile Gly Glu Tyr Asn Val Ser Lys Asp
7010          7015          7020
Gly Phe Phe Thr Tyr Leu Cys His Leu Ile Arg Asp Lys Leu Ala Leu
7025          7030          7035          7040
Gly Gly Ser Val Ala Ile Lys Ile Thr Glu Phe Ser Trp Asn Ala Glu
7045          7050          7055
Leu Tyr Ser Leu Met Gly Lys Phe Ala Phe Trp Thr Ile Phe Cys Thr
7060          7065          7070
Asn Val Asn Ala Ser Ser Ser Glu Gly Phe Leu Ile Gly Ile Asn Trp
7075          7080          7085
Leu Asn Lys Thr Arg Thr Glu Ile Asp Gly Lys Thr Met His Ala Asn
7090          7095          7100
Tyr Leu Phe Trp Arg Asn Ser Thr Met Trp Asn Gly Gly Ala Tyr Ser
7105          7110          7115          7120
Leu Phe Asp Met Ser Lys Phe Pro Leu Lys Ala Ala Gly Thr Ala Val
7125          7130          7135
Val Ser Leu Lys Pro Asp Gln Ile Asn Asp Leu Val Leu Ser Leu Ile
7140          7145          7150
Glu Lys Gly Lys Leu Leu Val Arg Asp Thr Arg Lys Glu Val Phe Val
7155          7160          7165
Gly Asp Ser Leu Val Asn Val Lys
7170          7175

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<210> 9898
<211> 451
<212> PRT
<213> Murine hepatitis virus

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SEQLIST-20480.TXT

```

<400> 9898
Met Ser Phe Val Pro Gly Gln Glu Asn Ala Gly Ser Arg Ser Ser Ser
1 5 10 15
Gly Asn Arg Ala Gly Asn Gly Ile Leu Lys Lys Thr Thr Trp Ala Asp
20 25 30
Gln Thr Glu Arg Gly Asn Arg Gly Arg Arg Asn His Pro Lys Gln Thr
35 40 45
Ala Thr Thr Gln Pro Asn Ala Gly Ser Val Val Pro His Tyr Ser Trp
50 55 60
Phe Ser Gly Ile Thr Gln Phe Gln Lys Gly Lys Glu Phe Gln Phe Ala
65 70 75 80
Gln Gly Gln Gly Val Pro Ile Ala Ser Gly Ile Pro Ala Ser Glu Gln
85 90 95
Lys Gly Tyr Trp Tyr Arg His Asn Arg Arg Ser Phe Lys Thr Pro Asp
100 105 110
Gly Gln His Lys Gln Leu Leu Pro Arg Trp Tyr Phe Tyr Tyr Leu Gly
115 120 125
Thr Gly Pro His Ala Gly Ala Glu Tyr Gly Asp Asp Ile Glu Gly Val
130 135 140
Val Trp Val Ala Ser Gln Gln Ala Asp Thr Lys Thr Thr Ala Asp Val
145 150 155 160
Val Glu Arg Asp Pro Ser Ser His Glu Ala Ile Pro Thr Arg Phe Ala
165 170 175
Pro Gly Thr Val Leu Pro Gln Gly Phe Tyr Val Glu Gly Ser Gly Arg
180 185 190
Ser Ala Pro Ala Ser Arg Ser Gly Ser Arg Ser Gln Ser Arg Gly Pro
195 200 205
Asn Asn Arg Ala Arg Ser Ser Ser Asn Gln Arg Gln Pro Ala Ser Ala
210 215 220
Val Lys Pro Asp Met Ala Glu Glu Ile Ala Ala Leu Val Leu Ala Lys
225 230 235 240
Leu Gly Lys Asp Ala Gly Gln Pro Lys Gln Val Thr Lys Gln Ser Ala
245 250 255
Lys Glu Val Arg Gln Lys Ile Leu Thr Lys Pro Arg Gln Lys Arg Thr
260 265 270
Pro Asn Lys Gln Cys Pro Val Gln Gln Cys Phe Gly Lys Arg Gly Pro
275 280 285
Asn Gln Asn Phe Gly Gly Ser Glu Met Leu Lys Leu Gly Thr Ser Asp
290 295 300
Pro Gln Phe Pro Ile Leu Ala Glu Leu Ala Pro Thr Pro Ser Ala Phe
305 310 315 320
Phe Phe Gly Ser Lys Leu Glu Leu Val Lys Lys Asn Ser Gly Gly Ala

```

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325

330

335

Asp Glu Pro Thr Lys Asp Val Tyr Glu Leu Gln Tyr Ser Gly Ala Ile  
 340 345 350  
 Arg Phe Asp Ser Thr Leu Pro Gly Phe Glu Thr Ile Met Lys Val Leu  
 355 360 365  
 Thr Glu Asn Leu Asn Ala Tyr Gln Asp Gln Ala Gly Ser Val Asp Leu  
 370 375 380  
 Val Ser Pro Lys Pro Pro Arg Arg Gly Arg Arg Gln Ala Gln Glu Lys  
 385 390 395 400  
 Lys Asp Glu Val Asp Asn Val Ser Val Ala Lys Pro Lys Ser Leu Val  
 405 410 415  
 Gln Arg Asn Val Ser Arg Glu Leu Thr Pro Glu Asp Arg Ser Leu Leu  
 420 425 430  
 Ala Gln Ile Leu Asp Asp Gly Val Val Pro Asp Gly Leu Glu Asp Asp  
 435 440 445  
 Ser Asn Val  
 450

<210> 9899  
 <211> 431  
 <212> PRT  
 <213> Murine hepatitis virus

<400> 9899  
 Met Ala Arg Thr Asp Ala Met Ala Pro Arg Thr Leu Leu Leu Val Leu  
 1 5 10 15  
 Ser Leu Gly Tyr Ala Phe Gly Phe Asn Glu Pro Leu Asn Val Val Ser  
 20 25 30  
 His Leu Asn Asp Asp Trp Phe Leu Phe Gly Asp Ser Arg Ser Asp Cys  
 35 40 45  
 Asn His Ile Asn Asn Leu Ser Gln Gln Asn Tyr Asn Tyr Met Asp Ile  
 50 55 60  
 Asn Pro Glu Leu Cys Lys Ser Gly Lys Ile Ser Ala Lys Ala Gly Asn  
 65 70 75 80  
 Ser Leu Phe Lys Ser Phe His Phe Thr Asp Phe Tyr Asn Tyr Thr Gly  
 85 90 95  
 Glu Gly Ser Gln Ile Ile Phe Tyr Glu Gly Val Asn Phe Thr Pro Tyr  
 100 105 110  
 Val Gly Phe Lys Cys Leu Asn Asn Gly Asp Asn Asn Arg Trp Met Gly  
 115 120 125  
 Asn Lys Ala Arg Phe Tyr Thr Gln Leu Tyr Gln Lys Met Ala His Tyr  
 130 135 140  
 Arg Ser Leu Ser Val Ile Asn Ile Thr Tyr Thr Tyr Asn Gly Ser Ala  
 145 150 155 160  
 Gly Pro Val Ser Met Cys Lys His Ile Ala Asn Gly Val Thr Leu Thr



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```

165                               170                               175
Leu Asn Asn Pro Thr Phe Ile Gly Lys Glu Val Ser Lys Pro Asp Tyr
180                               185                               190
Tyr Tyr Glu Ser Glu Ala Asn Phe Thr Leu Gln Gly Cys Asp Glu Phe
195                               200                               205
Ile Val Pro Leu Cys Val Phe Asn Gly Gln Tyr Leu Ser Ser Lys Leu
210                               215                               220
Tyr Tyr Asp Asp Ser Gln Tyr Tyr Tyr Asn Val Asp Thr Gly Val Leu
225                               230                               235
Tyr Gly Phe Asn Ser Thr Leu Asn Ile Thr Ser Gly Leu Asp Leu Thr
245                               250                               255
Cys Ile Tyr Leu Ala Leu Thr Pro Gly Asn Tyr Ile Ser Ile Ser Asn
260                               265                               270
Glu Leu Leu Leu Thr Val Pro Ser Lys Ala Ile Cys Leu Arg Lys Pro
275                               280                               285
Lys Ala Phe Thr Pro Val Gln Val Val Asp Ser Arg Trp His Ser Asn
290                               295                               300
Arg Gln Ser Asp Asn Met Thr Ala Ile Ala Cys Gln Leu Pro Tyr Cys
305                               310                               315
Tyr Phe Arg Asn Thr Thr Ser Asp Tyr Asn Gly Val Tyr Asp Ser His
325                               330                               335
His Gly Asp Ala Gly Phe Thr Ser Ile Leu Ala Gly Leu Met Tyr Asn
340                               345                               350
Val Ser Cys Leu Ala Gln Gln Gly Ala Phe Val Tyr Asn Asn Val Ser
355                               360                               365
Ser Ser Trp Pro Gln Tyr Pro Tyr Gly His Cys Pro Thr Ala Ala Asn
370                               375                               380
Ile Val Phe Met Ala Pro Val Cys Met Tyr Asp Pro Leu Pro Val Ile
385                               390                               395
Leu Leu Gly Val Leu Leu Gly Ile Ala Val Leu Ile Ile Val Phe Leu
405                               410                               415
Met Phe Tyr Phe Met Thr Asp Ser Gly Val Arg Leu His Glu Ala
420                               425                               430

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<210> 9900

<211> 88

<212> PRT

<213> Murine hepatitis virus

<400> 9900

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Met Phe Asn Leu Phe Leu Thr Asp Thr Val Trp Tyr Val Gly Gln Ile
1      5      10      15

```

```

Ile Phe Ile Val Ala Val Cys Leu Met Val Thr Ile Thr Val Val Ala
20     25     30

```

```

Phe Leu Ala Ser Ile Lys Leu Cys Ile Gln Leu Cys Gly Leu Cys Asn

```

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35 40 45  
 Thr Leu Val Leu Ser Pro Ser Ile Tyr Leu Tyr Asp Arg Ser Lys Gln  
 50 55 60  
 Leu Tyr Lys Tyr Tyr Asn Glu Glu Val Arg Pro Pro Pro Leu Glu Val  
 65 70 75 80  
 Asp Asp Ile Ile Ile Gln Thr Leu  
 85

<210> 9901  
 <211> 228  
 <212> PRT  
 <213> Murine hepatitis virus

<400> 9901  
 Met Thr Ser Thr Thr Gln Ala Pro Gln Pro Val Tyr Gln Trp Thr Ala  
 1 5 10 15  
 Asp Glu Ala Ile Arg Phe Leu Lys Glu Trp Asn Phe Ser Leu Gly Ile  
 20 25 30  
 Ile Leu Leu Phe Val Thr Ile Ile Leu Gln Phe Gly Tyr Thr Ser Arg  
 35 40 45  
 Ser Met Phe Val Tyr Val Val Lys Met Ile Leu Leu Trp Leu Met Trp  
 50 55 60  
 Pro Leu Thr Ile Val Leu Cys Ile Phe Asn Cys Val Tyr Ala Leu Asn  
 65 70 75 80  
 Asn Val Tyr Leu Gly Phe Ser Ile Val phe Thr Ile Val Ser Ile Ile  
 85 90 95  
 Met Trp Ile Met Tyr Phe Val Asn Ser Ile Arg Leu Phe Ile Arg Thr  
 100 105 110  
 Gly Ser Trp Trp Ser Phe Asn Pro Glu Thr Asn Asn Leu Met Cys Ile  
 115 120 125  
 Asp Met Lys Gly Thr Val Tyr Val Arg Pro Ile Ile Glu Asp Tyr His  
 130 135 140  
 Thr Leu Thr Ala Thr Ile Ile Arg Gly His Leu Tyr Met Gln Gly Val  
 145 150 155 160  
 Lys Leu Gly Thr Gly Phe Ser Leu Ser Asp Leu Pro Ala Tyr Val Thr  
 165 170 175  
 Val Ala Lys Val Ser His Leu Cys Thr Tyr Lys Arg Ala Phe Leu Asp  
 180 185 190  
 Lys Val Asp Gly Val Ser Gly Phe Ala Val Tyr Val Lys Ser Lys Val  
 195 200 205  
 Gly Asn Tyr Arg Leu Pro Ser Asn Lys Pro Ser Gly Met Asp Thr Ala  
 210 215 220  
 Leu Leu Arg Ile  
 225

<210> 9902

SEQLIST-20480.TXT

<211> 1328  
 <212> PRT  
 <213> Murine hepatitis virus

<400> 9902

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Met Leu Phe Val Phe Ile Leu Phe Leu Pro Ser Cys Leu Gly Tyr Ile
1      5      10      15
Gly Asp Phe Arg Cys Ile Gln Leu Val Asn Ser Asn Gly Ala Asn Val
      20      25      30
Ser Ala Pro Ser Ile Ser Thr Glu Thr Val Glu Val Ser Gln Gly Leu
      35      40      45
Gly Thr Tyr Tyr Val Leu Asp Arg Val Tyr Leu Asn Ala Thr Leu Leu
      50      55      60
Leu Thr Gly Tyr Tyr Pro Val Asp Gly Ser Lys Phe Arg Asn Leu Ala
      65      70      75      80
Leu Thr Gly Thr Asn Ser Val Ser Leu Ser Trp Phe Gln Pro Pro Tyr
      85      90      95
Leu Ser Gln Phe Asn Asp Gly Ile Phe Ala Lys Val Gln Asn Leu Lys
      100     105     110
Thr Ser Thr Pro Ser Gly Ala Thr Ala Tyr Phe Pro Thr Ile Val Ile
      115     120     125
Gly Ser Leu Phe Gly Tyr Thr Ser Tyr Thr Val Val Ile Glu Pro Tyr
      130     135     140
Asn Gly Val Ile Met Ala Ser Val Cys Gln Tyr Thr Ile Cys Gln Leu
      145     150     155     160
Pro Tyr Thr Asp Cys Lys Pro Asn Thr Asn Gly Asn Lys Leu Ile Gly
      165     170     175
Phe Trp His Thr Asp Val Lys Pro Pro Ile Cys Val Leu Lys Arg Asn
      180     185     190
Phe Thr Leu Asn Val Asn Ala Asp Ala Phe Tyr Phe His Phe Tyr Gln
      195     200     205
His Gly Gly Thr Phe Tyr Ala Tyr Tyr Ala Asp Lys Pro Ser Ala Thr
      210     215     220
Thr Phe Leu Phe Ser Val Tyr Ile Gly Asp Ile Leu Thr Gln Tyr Tyr
      225     230     235     240
Val Leu Pro Phe Ile Cys Asn Pro Thr Ala Gly Ser Thr Phe Ala Pro
      245     250     255
Arg Tyr Trp Val Thr Pro Leu Val Lys Arg Gln Tyr Leu Phe Asn Phe
      260     265     270
Asn Gln Lys Gly Val Ile Thr Ser Ala Val Asp Cys Ala Ser Ser Tyr
      275     280     285
Thr Ser Glu Ile Lys Cys Lys Thr Gln Ser Met Leu Pro Ser Thr Gly
      290     295     300
Val Tyr Glu Leu Ser Gly Tyr Thr Val Gln Pro Val Gly Val Val Tyr
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305					310					315					320
Arg	Arg	Val	Ala	Asn 325	Leu	Pro	Ala	Cys	Asn 330	Ile	Glu	Glu	Trp	Leu 335	Thr
Ala	Arg	Ser	Val 340	Pro	Ser	Pro	Leu	Asn 345	Trp	Glu	Arg	Lys	Thr 350	Phe	Gln
Asn	Cys	Asn 355	Phe	Asn	Leu	Ser	Ser 360	Leu	Leu	Arg	Tyr	Val 365	Gln	Ala	Glu
Ser	Leu 370	Phe	Cys	Asn	Asn	Ile 375	Asp	Ala	Ser	Lys	Val 380	Tyr	Gly	Arg	Cys
Phe 385	Gly	Ser	Ile	Ser	Val 390	Asp	Lys	Phe	Ala	Val 395	Pro	Arg	Ser	Arg	Gln 400
Val	Asp	Leu	Gln	Leu 405	Gly	Asn	Ser	Gly	Phe 410	Leu	Gln	Thr	Ala	Asn 415	Tyr
Lys	Ile	Asp	Thr 420	Ala	Ala	Thr	Ser	Cys 425	Gln	Leu	His	Tyr	Thr 430	Leu	Pro
Lys	Asn	Asn 435	Val	Thr	Ile	Asn	Asn 440	His	Asn	Pro	Ser	Ser 445	Trp	Asn	Arg
Arg	Cys 450	Gly	Phe	Asn	Asp	Ala 455	Gly	Val	Phe	Gly	Lys 460	Asn	Gln	His	Asp
Val 465	Val	Tyr	Ala	Gln	Gln 470	Cys	Phe	Thr	Val	Arg 475	Ser	Ser	Tyr	Cys	Pro 480
Cys	Ala	Gln	Pro	Gly 485	Lys	Val	Ser	Pro	Cys 490	Thr	Thr	Arg	Thr	Lys 495	Lys
Val	Leu	Lys	Pro 500	Lys	Ser	Ala	Phe	Val 505	Asn	Val	Gly	Asp	His 510	Cys	Glu
Gly	Leu	Gly 515	Val	Leu	Glu	Asp	Asn 520	Cys	Gly	Asn	Ala	Asp 525	Pro	His	Lys
Gly	Cys 530	Ile	Cys	Ala	Asn	Asn 535	Ser	Phe	Ile	Gly	Trp 540	Ser	His	Asp	Thr
Cys 545	Leu	Val	Asn	Asp	Arg 550	Cys	Gln	Ile	Phe	Ala 555	Asn	Ile	Leu	Leu	Asn 560
Gly	Ile	Asn	Ser	Gly 565	Thr	Thr	Cys	Ser	Thr 570	Asp	Leu	Gln	Leu	Pro 575	Asn
Thr	Glu	Val	Val 580	Thr	Gly	Ile	Cys	Val 585	Lys	Tyr	Asp	Leu	Tyr 590	Gly	Ile
Thr	Gly	Gln 595	Gly	Val	Phe	Lys	Glu 600	Val	Lys	Ala	Asp	Tyr 605	Tyr	Asn	Ser
Trp	Gln 610	Thr	Leu	Leu	Tyr	Asp 615	Val	Asn	Gly	Asn	Leu 620	Asn	Gly	Phe	Arg
Asp 625	Leu	Thr	Thr	Asn	Lys 630	Thr	Tyr	Thr	Ile	Arg 635	Ser	Cys	Tyr	Ser	Gly 640
Arg	Val	Ser	Ala	Ala	Phe	His	Lys	Asp	Ala	Pro	Glu	Pro	Ala	Leu	Leu

## 650

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SEQLIST-20480.TXT

980  
 Asp Ala Thr Asn Ser Ala Leu Gly Lys Ile Gln Ser Val Val Asn Ala  
 995 1000 1005  
 Asn Ala Glu Ala Leu Asn Asn Leu Leu Asn Gln Leu Ser Asn Arg Phe  
 1010 1015 1020  
 Gly Ala Ile Ser Ala Ser Leu Gln Glu Ile Leu Thr Arg Leu Glu Ala  
 1025 1030 1035 1040  
 Val Glu Ala Lys Ala Gln Ile Asp Arg Leu Ile Asn Gly Arg Leu Thr  
 1045 1050 1055  
 Ala Leu Asn Ala Tyr Ile Ser Lys Gln Leu Ser Asp Ser Thr Leu Ile  
 1060 1065 1070  
 Lys Val Ser Ala Ala Gln Ala Ile Glu Lys Val Asn Glu Cys Val Lys  
 1075 1080 1085  
 Ser Gln Thr Thr Arg Ile Asn Phe Cys Gly Asn Gly Asn His Ile Leu  
 1090 1095 1100  
 Ser Leu Val Gln Asn Ala Pro Tyr Gly Leu Tyr Phe Ile His Phe Ser  
 1105 1110 1115 1120  
 Tyr Val Pro Ile Ser Phe Thr Thr Ala Asn Val Ser Pro Gly Leu Cys  
 1125 1130 1135  
 Ile Ser Gly Asp Arg Gly Leu Ala Pro Lys Ala Gly Tyr Phe Val Gln  
 1140 1145 1150  
 Asp Asp Gly Glu Trp Lys Phe Thr Gly Ser Ser Tyr Tyr Tyr Pro Glu  
 1155 1160 1165  
 Pro Ile Thr Asp Lys Asn Ser Val Ile Met Ser Ser Cys Ala Val Asn  
 1170 1175 1180  
 Tyr Thr Lys Ala Pro Glu Val Phe Leu Asn Thr Ser Ile Pro Asn Pro  
 1185 1190 1195 1200  
 Pro Asp Phe Lys Glu Glu Leu Asp Lys Trp Phe Lys Asn Gln Thr Ser  
 1205 1210 1215  
 Ile Ala Pro Asp Leu Ser Leu Asp Phe Glu Lys Leu Asn Val Thr Leu  
 1220 1225 1230  
 Leu Asp Leu Thr Tyr Glu Met Asn Arg Ile Gln Asp Ala Ile Lys Lys  
 1235 1240 1245  
 Leu Asn Glu Ser Tyr Ile Asn Leu Lys Glu Val Gly Thr Tyr Glu Met  
 1250 1255 1260  
 Tyr Val Lys Trp Pro Trp Tyr Val Trp Leu Leu Ile Gly Leu Ala Gly  
 1265 1270 1275 1280  
 Val Ala Val Cys Val Leu Leu Phe Phe Ile Cys Cys Cys Thr Gly Cys  
 1285 1290 1295  
 Gly Ser Cys Cys Phe Lys Lys Cys Gly Asn Cys Cys Asp Glu Tyr Gly  
 1300 1305 1310  
 Gly His Gln Asp Ser Ile Val Ile His Asn Ile Ser Ser His Glu Asp

1315

1320

<210> 9903  
<211> 1230  
<212> DNA  
<213> Avian infectious bronchitis virus

<400> 9903  
atggcgagcg gtaagacaac tgggaagaca gacgccccag cgccagtcac caaactagga 60  
gggccaaaac cacctaaagt tggttcttct ggaaatgcat cttgggtttca agcactaaaa 120  
gccaaagaagt taaattcacc tcctcctaag tttgaaggta gcggcggtcc tgataatgaa 180  
aatctttaat taagccagca acatgggtac tggagacgtc aagccaggta caagccagg 240  
aaaggcgga gaaaatcagt cccagatgct tgggtacttct attacactgg aacaggacca 300  
gccgctgacc tgaattgggg tgatagccaa gatggtatag tgtgggtttc tgcaaaggg 360  
gctgatacta aatctagatc taaccagggt acaagggatc ctgataagtt tgaccaatac 420  
ccgctacgat tctcagatgg aggacctgat ggtaatttcc gtggggactt cattccaata 480  
aatcgtggta ggagtggaa atcaacagcg gcttcacacag cagcatctag tagagcaccg 540  
tcgctgatg gctcgcgtgg acgtagaagc ggagctgaag atgatcttat agctcgtgca 600  
gcaaagatca ttcaggatca gcagaagaag ggttctcgca ttactaaagc taaggccgat 660  
gaaatggctc atcgccggta ttgtaagcgt actatcccac ctgggtataa ggttgatcaa 720  
gtatttgggtc cccgtactaa aggtaaggag ggaaattttg gtgatgacaa gatgaatgag 780  
gaggggtatta aggatgggag cgttatagca atgctcaacc tagtccctag cagccatgct 840  
tgtctttttg gaagtagagt gacgccccaa cttcaaccag atgggctgca cttgagattt 900  
gaatttatta ctgtgggttc acgtgatgat ccgcagtttg ataattatgt gaaaatttgt 960  
gatcagtggtg tcgatgggtg agggacgcgt ccaaaagacg atgaaccgag accaaagtca 1020  
cgcccaaatt caagacctgc tacaagaaca agttctccag cgccaagaca acagcgtcaa 1080  
aagaaggaga agaagtcaaa gaagcaggat gatgaagtag ataaggcatt gacctcagat 1140  
gaggagagga acaatgcaca gctggaattt gatgatgaac ccaagggtgat taactggggg 1200  
gattcagcac ttggagagaa tgagttgtaa 1230

<210> 9904  
<211> 600  
<212> DNA  
<213> Avian infectious bronchitis virus

<400> 9904  
atgtccaacg aaacaaattg tactcttgac tttgaacagt cagttgagct ttttaaagag 60  
tataatttat ttataactgc attcttggtg ttcttaacca taatacttca gtatgggttat 120  
gcaacaagaa gtaagtttat ttatatactt aaaatgatag tggtatgggtg cttttggccc 180  
cttaacattg cagtaggtgt aatttcattg atataccac caaacacagg aggtcttggtc 240  
gcagcgataa tacttactgt gtttgcgtgt ctttcttttg taggttattg gatccagagt 300  
attagactct ttaagcgggt tagatcttgg tggtcattta acccagaatc taacgccgta 360  
ggttcaatac tcctaactaa tggtaacaa tgtaattttg ctatagagag tgtgccgatg 420  
gtgcttttct ctattataaa gaatgggtgt ctttattgtg agggtcagtg gcttgctaaa 480  
tgtgaaccag accacttgcc taaagacata tttgtatgca caccagatag acgtaatatc 540  
tatcgtatgg tgcagaaata cattggtgac caaagcggaa ataagaaaag gtttgctaca 600

<210> 9905  
<211> 6629  
<212> PRT  
<213> Avian infectious bronchitis virus

<400> 9905  
Met Ala Ser Ser Leu Lys Gln Gly Val Ser Pro Lys Pro Arg Asp Val  
1 5 10 15  
Ile Leu Val Ser Lys Asp Ile Pro Glu Gln Leu Cys Asp Ala Leu Phe  
20 25 30  
Phe Tyr Thr Ser His Asn Pro Lys Asp Tyr Ala Asp Ala Phe Ala Val  
35 40 45

SEQLIST-20480.TXT

Arg Gln Lys Phe Asp Arg Ser Leu Gln Thr Gly Lys Gln Phe Lys Phe  
 50 55 60  
 Glu Thr Val Cys Gly Leu Phe Leu Leu Lys Gly Val Asp Lys Ile Thr  
 65 70 75 80  
 Pro Gly Val Pro Ala Lys Val Leu Lys Ala Thr Ser Lys Leu Ala Asp  
 85 90 95  
 Leu Glu Asp Ile Phe Gly Val Ser Pro Leu Ala Arg Lys Tyr Arg Glu  
 100 105 110  
 Leu Leu Lys Thr Ala Cys Gln Trp Ser Leu Thr Val Glu Ala Leu Asp  
 115 120 125  
 Val Arg Ala Gln Thr Leu Asp Glu Ile Phe Asp Pro Thr Glu Ile Leu  
 130 135 140  
 Trp Leu Gln Val Ala Ala Lys Ile His Val Ser Ser Met Ala Met Arg  
 145 150 155 160  
 Arg Leu Val Gly Glu Val Thr Ala Lys Val Met Asp Ala Leu Gly Ser  
 165 170 175  
 Asn Leu Ser Ala Leu Phe Gln Ile Val Lys Gln Gln Ile Ala Arg Ile  
 180 185 190  
 Phe Gln Lys Ala Leu Ala Ile Phe Glu Asn Val Asn Glu Leu Pro Gln  
 195 200 205  
 Arg Ile Ala Ala Leu Lys Met Ala Phe Ala Lys Cys Ala Arg Ser Ile  
 210 215 220  
 Thr Val Val Val Val Glu Arg Thr Leu Val Val Lys Glu Phe Ala Gly  
 225 230 235 240  
 Thr Cys Leu Ala Ser Ile Asn Gly Ala Val Ala Lys Phe Phe Glu Glu  
 245 250 255  
 Leu Pro Asn Gly Phe Met Gly Ser Lys Ile Phe Thr Thr Leu Ala Phe  
 260 265 270  
 Phe Lys Glu Ala Ala Val Arg Val Val Glu Asn Ile Pro Asn Ala Pro  
 275 280 285  
 Arg Gly Thr Lys Gly Phe Glu Val Val Gly Asn Ala Lys Gly Thr Gln  
 290 295 300  
 Val Val Val Arg Gly Met Arg Asn Asp Leu Thr Leu Leu Asp Gln Lys  
 305 310 315 320  
 Ala Asp Ile Pro Val Glu Pro Glu Gly Trp Ser Ala Ile Leu Asp Gly  
 325 330 335  
 His Leu Cys Tyr Val Phe Arg Ser Gly Asp Arg Phe Tyr Ala Ala Pro  
 340 345 350  
 Leu Ser Gly Asn Phe Ala Leu Ser Asp Val His Cys Cys Glu Arg Val  
 355 360 365  
 Val Cys Leu Ser Asp Gly Val Thr Pro Glu Ile Asn Asp Gly Leu Ile  
 370 375 380



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Leu Ala Ala Ile Tyr Ser Ser Phe Ser Val Ser Glu Leu Val Thr Ala  
 385 390 395 400  
 Leu Lys Lys Gly Glu Pro Phe Lys Phe Leu Gly His Lys Phe Val Tyr  
 405 410 415  
 Ala Lys Asp Ala Ala Val Ser Phe Thr Leu Ala Lys Ala Ala Thr Ile  
 420 425 430  
 Ala Asp Val Leu Arg Leu Phe Gln Ser Ala Arg Val Ile Ala Glu Asp  
 435 440 445  
 Val Trp Ser Ser Phe Thr Glu Lys Ser Phe Glu Phe Trp Lys Leu Ala  
 450 455 460  
 Tyr Gly Lys Val Arg Asn Leu Glu Glu Phe Val Lys Thr Tyr Val Cys  
 465 470 475 480  
 Lys Ala Gln Met Ser Ile Val Ile Leu Ala Ala Val Leu Gly Glu Asp  
 485 490 495  
 Ile Trp His Leu Val Ser Gln Val Ile Tyr Lys Leu Gly Val Leu Phe  
 500 505 510  
 Thr Lys Val Val Asp Phe Cys Asp Lys His Trp Lys Gly Phe Cys Val  
 515 520 525  
 Gln Leu Lys Arg Ala Lys Leu Ile Val Thr Glu Thr Phe Cys Val Leu  
 530 535 540  
 Lys Gly Val Ala Gln His Cys Phe Gln Leu Leu Leu Asp Ala Ile His  
 545 550 555 560  
 Ser Leu Tyr Lys Ser Phe Lys Lys Cys Ala Leu Gly Arg Ile His Gly  
 565 570 575  
 Asp Leu Leu Phe Trp Lys Gly Gly Val His Lys Ile Val Gln Asp Gly  
 580 585 590  
 Asp Glu Ile Trp Phe Asp Ala Ile Asp Ser Val Asp Val Glu Asp Leu  
 595 600 605  
 Gly Val Val Gln Glu Lys Ser Ile Asp Phe Glu Val Cys Asp Asp Val  
 610 615 620  
 Thr Leu Pro Glu Asn Gln Pro Gly His Met Val Gln Ile Glu Asp Asp  
 625 630 635 640  
 Gly Lys Asn Tyr Met Phe Phe Arg Phe Lys Lys Asp Glu Asn Ile Tyr  
 645 650 655  
 Tyr Thr Pro Met Ser Gln Leu Gly Ala Ile Asn Val Val Cys Lys Ala  
 660 665 670  
 Gly Gly Lys Thr Val Thr Phe Gly Glu Thr Thr Val Gln Glu Ile Pro  
 675 680 685  
 Pro Pro Asp Val Val Pro Ile Lys Val Ser Ile Glu Cys Cys Gly Glu  
 690 695 700  
 Pro Trp Asn Thr Ile Phe Lys Lys Ala Tyr Lys Glu Pro Ile Glu Val  
 705 710 715 720

SEQLIST-20480.TXT

Asp Thr Asp Leu Thr Val Glu Gln Leu Leu Ser Val Ile Tyr Glu Lys  
 725 730 735  
 Met Cys Asp Asp Leu Lys Leu Phe Pro Glu Ala Pro Glu Pro Pro Pro  
 740 745 750  
 Phe Glu Asn Val Ala Leu Val Asp Lys Asn Gly Lys Asp Leu Asp Cys  
 755 760 765  
 Ile Lys Ser Cys His Leu Ile Tyr Arg Asp Tyr Glu Ser Asp Asp Asp  
 770 775 780  
 Ile Glu Glu Glu Asp Ala Glu Glu Cys Asp Thr Asp Ser Gly Glu Ala  
 785 790 795 800  
 Glu Glu Cys Asp Thr Asn Ser Glu Cys Glu Glu Glu Asp Glu Asp Thr  
 805 810 815  
 Lys Val Leu Ala Leu Ile Gln Asp Pro Ala Ser Ile Lys Tyr Pro Leu  
 820 825 830  
 Pro Leu Asp Glu Asp Tyr Ser Val Tyr Asn Gly Cys Ile Val His Lys  
 835 840 845  
 Asp Ala Leu Asp Val Val Asn Leu Pro Ser Gly Glu Glu Thr Phe Val  
 850 855 860  
 Val Asn Asn Cys Phe Glu Gly Ala Val Lys Pro Leu Pro Gln Lys Val  
 865 870 875 880  
 Val Asp Val Leu Gly Asp Trp Gly Glu Ala Val Asp Ala Gln Glu Gln  
 885 890 895  
 Leu Cys Gln Gln Glu Pro Leu Gln His Thr Phe Glu Glu Pro Val Glu  
 900 905 910  
 Asn Ser Thr Gly Ser Ser Lys Thr Met Thr Glu Gln Val Val Val Glu  
 915 920 925  
 Asp Gln Glu Leu Pro Val Val Glu Gln Asp Gln Asp Val Val Val Tyr  
 930 935 940  
 Thr Pro Thr Asp Leu Glu Val Ala Lys Glu Thr Ala Glu Glu Val Asp  
 945 950 955 960  
 Glu Phe Ile Leu Ile Phe Ala Val Pro Lys Glu Glu Val Val Ser Gln  
 965 970 975  
 Lys Asp Gly Ala Gln Ile Lys Gln Glu Pro Ile Gln Val Val Lys Pro  
 980 985 990  
 Gln Arg Glu Lys Lys Ala Lys Lys Phe Lys Val Lys Pro Ala Thr Cys  
 995 1000 1005  
 Glu Lys Pro Lys Phe Leu Glu Tyr Lys Thr Cys Val Gly Asp Leu Thr  
 1010 1015 1020  
 Val Val Ile Ala Lys Ala Leu Asp Glu Phe Lys Glu Phe Cys Ile Val  
 1025 1030 1035 1040  
 Asn Ala Ala Asn Glu His Met Thr His Gly Ser Gly Val Ala Lys Ala  
 1045 1050 1055

SEQLIST-20480.TXT

Ile Ala Asp Phe Cys Gly Leu Asp Phe Val Glu Tyr Cys Glu Asp Tyr  
1060 1065 1070

Val Lys Lys His Gly Pro Gln Gln Arg Leu Val Thr Pro Ser Phe Val  
1075 1080 1085

Lys Gly Ile Gln Cys Val Asn Asn Val Val Gly Pro Arg His Gly Asp  
1090 1095 1100

Asn Asn Leu His Glu Lys Leu Val Ala Ala Tyr Lys Asn Val Leu Val  
1105 1110 1115 1120

Asp Gly Val Val Asn Tyr Val Val Pro Val Leu Ser Leu Gly Ile Phe  
1125 1130 1135

Gly Val Asp Phe Lys Met Ser Ile Asp Ala Met Arg Glu Ala Phe Glu  
1140 1145 1150

Gly Cys Thr Ile Arg Val Leu Leu Phe Ser Leu Ser Gln Glu His Ile  
1155 1160 1165

Asp Tyr Phe Asp Val Thr Cys Lys Gln Lys Thr Ile Tyr Leu Thr Glu  
1170 1175 1180

Asp Gly Val Lys Tyr Arg Ser Ile Val Leu Lys Pro Gly Asp Ser Leu  
1185 1190 1195 1200

Gly Gln Phe Gly Gln Val Tyr Ala Lys Asn Lys Ile Val Phe Thr Ala  
1205 1210 1215

Asp Asp Val Glu Asp Lys Glu Ile Leu Tyr Val Pro Thr Thr Asp Lys  
1220 1225 1230

Ser Ile Leu Glu Tyr Tyr Gly Leu Asp Ala Gln Lys Tyr Val Ile Tyr  
1235 1240 1245

Leu Gln Thr Leu Ala Gln Lys Trp Asn Val Gln Tyr Arg Asp Asn Phe  
1250 1255 1260

Leu Ile Leu Glu Trp Arg Asp Gly Asn Cys Trp Ile Ser Ser Ala Ile  
1265 1270 1275 1280

Val Leu Leu Gln Ala Ala Lys Ile Arg Phe Lys Gly Phe Leu Thr Glu  
1285 1290 1295

Ala Trp Ala Lys Leu Leu Gly Gly Asp Pro Thr Asp Phe Val Ala Trp  
1300 1305 1310

Cys Tyr Ala Ser Cys Thr Ala Lys Val Gly Asp Phe Ser Asp Ala Asn  
1315 1320 1325

Trp Leu Leu Ala Asn Leu Ala Glu His Phe Asp Ala Asp Tyr Thr Asn  
1330 1335 1340

Ala Phe Leu Lys Lys Arg Val Ser Cys Asn Cys Gly Ile Lys Ser Tyr  
1345 1350 1355 1360

Glu Leu Arg Gly Leu Glu Ala Cys Ile Gln Pro Val Arg Ala Thr Asn  
1365 1370 1375

Leu Leu His Phe Lys Thr Gln Tyr Ser Asn Cys Pro Thr Cys Gly Ala  
1380 1385 1390

SEQLIST-20480.TXT

Asn Asn Thr Asp Glu Val Ile Glu Ala Ser Leu Pro Tyr Leu Leu Leu  
1395 1400 1405

Phe Ala Thr Asp Gly Pro Ala Thr Val Asp Cys Asp Glu Asp Ala Val  
1410 1415 1420

Gly Thr Val Val Phe Val Gly Ser Thr Asn Ser Gly His Cys Tyr Thr  
1425 1430 1435 1440

Gln Ala Ala Gly Gln Ala Phe Asp Asn Leu Ala Lys Asp Arg Lys Phe  
1445 1450 1455

Gly Lys Lys Ser Pro Tyr Ile Thr Ala Met Tyr Thr Arg Phe Ala Phe  
1460 1465 1470

Lys Asn Glu Thr Ser Leu Pro Val Ala Lys Gln Ser Lys Gly Lys Ser  
1475 1480 1485

Lys Ser Val Lys Glu Asp Val Ser Asn Leu Ala Thr Ser Ser Lys Ala  
1490 1495 1500

Ser Phe Asp Asn Leu Thr Asp Phe Glu Gln Trp Tyr Asp Ser Asn Ile  
1505 1510 1515 1520

Tyr Glu Ser Leu Lys Val Gln Glu Ser Pro Asp Asn Phe Asp Lys Tyr  
1525 1530 1535

Val Ser Phe Thr Thr Lys Glu Asp Ser Lys Leu Pro Leu Thr Leu Lys  
1540 1545 1550

Val Arg Gly Ile Lys Ser Val Val Asp Phe Arg Ser Lys Asp Gly Phe  
1555 1560 1565

Ile Tyr Lys Leu Thr Pro Asp Thr Asp Glu Asn Ser Lys Ala Pro Val  
1570 1575 1580

Tyr Tyr Pro Val Leu Asp Ala Ile Ser Leu Lys Ala Ile Trp Val Glu  
1585 1590 1595 1600

Gly Asn Ala Asn Phe Val Val Gly His Pro Asn Tyr Tyr Ser Lys Ser  
1605 1610 1615

Leu His Ile Pro Thr Phe Trp Glu Asn Ala Glu Asn Phe Val Lys Met  
1620 1625 1630

Gly Asp Lys Ile Gly Gly Val Thr Met Gly Leu Trp Arg Ala Glu His  
1635 1640 1645

Leu Asn Lys Pro Asn Leu Glu Arg Ile Phe Asn Ile Ala Lys Lys Ala  
1650 1655 1660

Ile Val Gly Ser Ser Val Val Thr Thr Gln Cys Gly Lys Leu Ile Gly  
1665 1670 1675 1680

Lys Ala Ala Thr Phe Ile Ala Asp Lys Val Gly Gly Gly Val Val Arg  
1685 1690 1695

Asn Ile Thr Asp Ser Ile Lys Gly Leu Cys Gly Ile Thr Arg Gly His  
1700 1705 1710

Phe Glu Arg Lys Met Ser Pro Gln Phe Leu Lys Thr Leu Met Phe Phe  
1715 1720 1725

SEQLIST-20480.TXT

Leu Phe Tyr Phe Leu Lys Ala Ser Val Lys Ser Val Val Ala Ser Tyr  
 1730 1735 1740  
 Lys Thr Val Leu Cys Lys Val Val Leu Ala Thr Leu Leu Ile Val Trp  
 1745 1750 1755 1760  
 Phe Val Tyr Thr Ser Asn Pro Val Met Phe Thr Gly Ile Arg Val Leu  
 1765 1770 1775  
 Asp Phe Leu Phe Glu Gly Ser Leu Cys Gly Pro Tyr Lys Asp Tyr Gly  
 1780 1785 1790  
 Lys Asp Ser Phe Asp Val Leu Arg Tyr Cys Ala Asp Asp Phe Ile Cys  
 1795 1800 1805  
 Arg Val Cys Leu His Asp Lys Asp Ser Leu His Leu Tyr Lys His Ala  
 1810 1815 1820  
 Tyr Ser Val Glu Gln Val Tyr Lys Asp Ala Ala Ser Gly Phe Ile Phe  
 1825 1830 1835 1840  
 Asn Trp Asn Trp Leu Tyr Leu Val Phe Leu Ile Leu Phe Val Lys Pro  
 1845 1850 1855  
 Val Ala Gly Phe Val Ile Ile Cys Tyr Cys Val Lys Tyr Leu Val Leu  
 1860 1865 1870  
 Asn Ser Thr Val Leu Gln Thr Gly Val Cys Phe Leu Asp Trp Phe Val  
 1875 1880 1885  
 Gln Thr Val Phe Ser His Phe Asn Phe Met Gly Ala Gly Phe Tyr Phe  
 1890 1895 1900  
 Trp Leu Phe Tyr Lys Ile Tyr Ile Gln Val His His Ile Leu Tyr Cys  
 1905 1910 1915 1920  
 Lys Asp Val Thr Cys Glu Val Cys Lys Arg Val Ala Arg Ser Asn Arg  
 1925 1930 1935  
 Gln Glu Val Ser Val Val Val Gly Gly Arg Lys Gln Ile Val His Val  
 1940 1945 1950  
 Tyr Thr Asn Ser Gly Tyr Asn Phe Cys Lys Arg His Asn Trp Tyr Cys  
 1955 1960 1965  
 Arg Asn Cys Asp Asp Tyr Gly His Gln Asn Thr Phe Met Ser Pro Glu  
 1970 1975 1980  
 Val Ala Gly Glu Leu Ser Glu Lys Leu Lys Arg His Val Lys Pro Thr  
 1985 1990 1995 2000  
 Ala Tyr Ala Tyr His Val Val Asp Glu Ala Cys Leu Val Asp Asp Phe  
 2005 2010 2015  
 Val Asn Leu Lys Tyr Lys Ala Ala Thr Pro Gly Lys Asp Ser Ala Ser  
 2020 2025 2030  
 Ser Ala Val Lys Cys Phe Ser Val Thr Asp Phe Leu Lys Lys Ala Val  
 2035 2040 2045  
 Phe Leu Lys Glu Ala Leu Lys Cys Glu Gln Ile Ser Asn Asp Gly Phe  
 2050 2055 2060

SEQLIST-20480.TXT

Ile Val Cys Asn Thr Gln Ser Ala His Ala Leu Glu Ala Lys Asn  
2065 2070 2075 2080

Ala Ala Ile Tyr Tyr Ala Gln Tyr Leu Cys Lys Pro Ile Leu Ile Leu  
2085 2090 2095

Asp Gln Ala Leu Tyr Glu Gln Leu Val Val Glu Pro Val Ser Lys Ser  
2100 2105 2110

Val Ile Asp Lys Val Cys Ser Ile Leu Ser Ser Ile Ile Ser Val Asp  
2115 2120 2125

Thr Ala Ala Leu Asn Tyr Lys Ala Gly Thr Leu Arg Asp Ala Leu Leu  
2130 2135 2140

Ser Ile Thr Lys Asp Glu Glu Ala Val Asp Met Ala Ile Phe Cys His  
2145 2150 2155 2160

Asn His Asp Val Asp Tyr Thr Gly Asp Gly Phe Thr Asn Val Ile Pro  
2165 2170 2175

Ser Tyr Gly Ile Asp Thr Gly Lys Leu Thr Pro Arg Asp Arg Gly Phe  
2180 2185 2190

Leu Ile Asn Ala Asp Ala Ser Ile Ala Asn Leu Arg Val Lys Asn Ala  
2195 2200 2205

Pro Pro Val Val Trp Lys Phe Ser Glu Leu Ile Lys Leu Ser Asp Ser  
2210 2215 2220

Cys Leu Lys Tyr Leu Ile Ser Ala Thr Val Lys Ser Gly Val Arg Phe  
2225 2230 2235 2240

Phe Ile Thr Lys Ser Gly Ala Lys Gln Val Ile Ala Cys His Thr Gln  
2245 2250 2255

Lys Leu Leu Val Glu Lys Lys Ala Gly Gly Ile Val Ser Gly Thr Phe  
2260 2265 2270

Lys Cys Phe Lys Ser Tyr Phe Lys Trp Leu Leu Ile Phe Tyr Ile Leu  
2275 2280 2285

Phe Thr Ala Cys Cys Ser Gly Tyr Tyr Tyr Met Glu Val Ser Lys Ser  
2290 2295 2300

Phe Val His Pro Met Tyr Asp Val Asn Ser Thr Leu His Val Glu Gly  
2305 2310 2315 2320

Phe Lys Val Ile Asp Lys Gly Val Leu Arg Glu Ile Val Pro Glu Asp  
2325 2330 2335

Thr Cys Phe Ser Asn Lys Phe Val Asn Phe Asp Ala Phe Trp Gly Arg  
2340 2345 2350

Pro Tyr Asp Asn Ser Arg Asn Cys Pro Ile Val Thr Ala Val Ile Asp  
2355 2360 2365

Gly Asp Gly Thr Val Ala Thr Gly Val Pro Gly Phe Val Ser Trp Val  
2370 2375 2380

Met Asp Gly Val Met Phe Ile His Met Thr Gln Thr Glu Arg Lys Pro  
2385 2390 2395 2400

SEQLIST-20480.TXT

Trp Tyr Ile Pro Thr Trp Phe Asn Arg Glu Ile Val Gly Tyr Thr Gln  
2405 2410 2415

Asp Ser Ile Ile Thr Glu Gly Ser Phe Tyr Thr Ser Ile Ala Leu Phe  
2420 2425 2430

Ser Ala Arg Cys Leu Tyr Leu Thr Ala Ser Asn Thr Pro Gln Leu Tyr  
2435 2440 2445

Cys Phe Asn Gly Asp Asn Asp Ala Pro Gly Ala Leu Pro Phe Gly Ser  
2450 2455 2460

Ile Ile Pro His Arg Val Tyr Phe Gln Pro Asn Gly Val Arg Leu Ile  
2465 2470 2475 2480

Val Pro Gln Gln Ile Leu His Thr Pro Tyr Val Val Lys Phe Val Ser  
2485 2490 2495

Asp Ser Tyr Cys Arg Gly Ser Val Cys Glu Tyr Thr Arg Pro Gly Tyr  
2500 2505 2510

Cys Val Ser Leu Asn Pro Gln Trp Val Leu Phe Asn Asp Glu Tyr Thr  
2515 2520 2525

Ser Lys Pro Gly Val Phe Cys Gly Ser Thr Val Arg Glu Leu Met Phe  
2530 2535 2540

Ser Met Val Ser Thr Phe Phe Thr Gly Val Asn Pro Asn Ile Tyr Met  
2545 2550 2555 2560

Gln Leu Ala Thr Met Phe Leu Ile Leu Val Val Val Val Leu Ile Phe  
2565 2570 2575

Ala Met Val Ile Lys Phe Gln Gly Val Phe Lys Ala Tyr Ala Thr Thr  
2580 2585 2590

Val Phe Ile Thr Met Leu Val Trp Val Ile Asn Ala Phe Ile Leu Cys  
2595 2600 2605

Val His Ser Tyr Asn Ser Val Leu Ala Val Ile Leu Leu Val Leu Tyr  
2610 2615 2620

Cys Tyr Ala Ser Leu Val Thr Ser Arg Asn Thr Val Ile Ile Met His  
2625 2630 2635 2640

Cys Trp Leu Val Phe Thr Phe Gly Leu Ile Val Pro Thr Trp Leu Ala  
2645 2650 2655

Cys Cys Tyr Leu Gly Phe Ile Ile Tyr Met Tyr Thr Pro Leu Phe Leu  
2660 2665 2670

Trp Cys Tyr Gly Thr Thr Lys Asn Thr Arg Lys Leu Tyr Asp Gly Asn  
2675 2680 2685

Glu Phe Val Gly Asn Tyr Asp Leu Ala Ala Lys Ser Thr Phe Val Ile  
2690 2695 2700

Arg Gly Ser Glu Phe Val Lys Leu Thr Asn Glu Ile Gly Asp Lys Phe  
2705 2710 2715 2720

Glu Ala Tyr Leu Ser Ala Tyr Ala Arg Leu Lys Tyr Tyr Ser Gly Thr  
2725 2730 2735

SEQLIST-20480.TXT

Gly Ser Glu Gln Asp Tyr Leu Gln Ala Cys Arg Ala Trp Leu Ala Tyr  
2740 2745 2750

Ala Leu Asp Gln Tyr Arg Asn Ser Gly Val Glu Ile Val Tyr Thr Pro  
2755 2760 2765

Pro Arg Tyr Ser Ile Gly Val Ser Arg Leu Gln Ser Gly Phe Lys Lys  
2770 2775 2780

Leu Val Ser Pro Ser Ser Ala Val Glu Lys Cys Ile Val Ser Val Ser  
2785 2790 2795 2800

Tyr Arg Gly Asn Asn Leu Asn Gly Leu Trp Leu Gly Asp Thr Ile Tyr  
2805 2810 2815

Cys Pro Arg His Val Leu Gly Lys Phe Ser Gly Asp Gln Trp Asn Asp  
2820 2825 2830

Val Leu Asn Leu Ala Asn Asn His Glu Phe Glu Val Thr Thr Gln His  
2835 2840 2845

Gly Val Thr Leu Asn Val Val Ser Arg Arg Leu Lys Gly Ala Val Leu  
2850 2855 2860

Ile Leu Gln Thr Ala Val Ala Asn Ala Glu Thr Pro Lys Tyr Lys Phe  
2865 2870 2875 2880

Ile Lys Ala Asn Cys Gly Asp Ser Phe Thr Ile Ala Cys Ala Tyr Gly  
2885 2890 2895

Gly Thr Val Val Gly Leu Tyr Pro Val Thr Met Arg Ser Asn Gly Thr  
2900 2905 2910

Ile Arg Ala Ser Phe Leu Ala Gly Ala Cys Gly Ser Val Gly Phe Asn  
2915 2920 2925

Ile Glu Lys Gly Val Val Asn Phe Phe Tyr Met His His Leu Glu Leu  
2930 2935 2940

Pro Asn Ala Leu His Thr Gly Thr Asp Leu Met Gly Glu Phe Tyr Gly  
2945 2950 2955 2960

Gly Tyr Val Asp Glu Glu Val Ala Gln Arg Val Pro Pro Asp Asn Leu  
2965 2970 2975

Val Thr Asn Asn Ile Val Ala Trp Leu Tyr Ala Ala Ile Ile Ser Val  
2980 2985 2990

Lys Glu Ser Ser Phe Ser Leu Pro Lys Trp Leu Glu Ser Thr Thr Val  
2995 3000 3005

Ser Val Asp Asp Tyr Asn Lys Trp Ala Gly Asp Asn Gly Phe Thr Pro  
3010 3015 3020

Phe Ser Thr Ser Thr Ala Ile Thr Lys Leu Ser Ala Ile Thr Gly Val  
3025 3030 3035 3040

Asp Val Cys Lys Leu Leu Arg Thr Ile Met Val Lys Asn Ser Gln Trp  
3045 3050 3055

Gly Gly Asp Pro Ile Leu Gly Gln Tyr Asn Phe Glu Asp Glu Leu Thr  
3060 3065 3070



SEQLIST-20480.TXT

Pro Glu Ser Val Phe Asn Gln Ile Gly Gly Val Arg Leu Gln Ser Ser  
3075 3080 3085

Phe Val Arg Lys Ala Thr Ser Trp Phe Trp Ser Arg Cys Val Leu Ala  
3090 3095 3100

Cys Phe Leu Phe Val Leu Cys Ala Ile Val Leu Phe Thr Ala Val Pro  
3105 3110 3115 3120

Leu Lys Phe Tyr Val Tyr Ala Ala Val Ile Leu Leu Met Ala Val Leu  
3125 3130 3135

Phe Ile Ser Phe Thr Val Lys His Val Met Ala Tyr Met Asp Thr Phe  
3140 3145 3150

Leu Leu Pro Thr Leu Ile Thr Val Ile Ile Gly Val Cys Ala Glu Val  
3155 3160 3165

Pro Phe Ile Tyr Asn Thr Leu Ile Ser Gln Val Val Ile Phe Leu Ser  
3170 3175 3180

Gln Trp Tyr Asp Pro Val Val Phe Asp Thr Met Val Pro Trp Met Phe  
3185 3190 3195 3200

Leu Pro Leu Val Leu Tyr Thr Ala Phe Lys Cys Val Gln Gly Cys Tyr  
3205 3210 3215

Met Asn Ser Phe Asn Thr Ser Leu Leu Met Leu Tyr Gln Phe Val Lys  
3220 3225 3230

Leu Gly Phe Val Ile Tyr Thr Ser Ser Asn Thr Leu Thr Ala Tyr Thr  
3235 3240 3245

Glu Gly Asn Trp Glu Leu Phe Phe Glu Leu Val His Thr Thr Val Leu  
3250 3255 3260

Ala Asn Val Ser Ser Asn Ser Leu Ile Gly Leu Phe Val Phe Lys Cys  
3265 3270 3275 3280

Ala Lys Trp Met Leu Tyr Tyr Cys Asn Ala Thr Tyr Leu Asn Asn Tyr  
3285 3290 3295

Val Leu Met Ala Val Met Val Asn Cys Ile Gly Trp Leu Cys Thr Cys  
3300 3305 3310

Tyr Phe Gly Leu Tyr Trp Trp Val Asn Lys Val Phe Gly Leu Thr Leu  
3315 3320 3325

Gly Lys Tyr Asn Phe Lys Val Ser Val Asp Gln Tyr Arg Tyr Met Cys  
3330 3335 3340

Leu His Lys Ile Asn Pro Pro Lys Thr Val Trp Glu Val Phe Ser Thr  
3345 3350 3355 3360

Asn Ile Leu Ile Gln Gly Ile Gly Gly Asp Arg Val Leu Pro Ile Ala  
3365 3370 3375

Thr Val Gln Ala Lys Leu Ser Asp Val Lys Cys Thr Thr Val Val Leu  
3380 3385 3390

Met Gln Leu Leu Thr Lys Leu Asn Val Glu Ala Asn Ser Lys Met His  
3395 3400 3405

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Val Tyr Leu Val Glu Leu His Asn Lys Ile Leu Ala Ser Asp Asp Val  
3410 3415 3420

Gly Glu Cys Met Asp Asn Leu Leu Gly Met Leu Ile Thr Leu Phe Cys  
3425 3430 3435 3440

Ile Asp Ser Thr Ile Asp Leu Ser Glu Tyr Cys Asp Asp Ile Leu Lys  
3445 3450 3455

Arg Ser Thr Val Leu Gln Ser Val Thr Gln Glu Phe Ser His Ile Pro  
3460 3465 3470

Ser Tyr Ala Glu Tyr Glu Arg Ala Lys Asn Leu Tyr Glu Lys Val Leu  
3475 3480 3485

Val Asp Ser Lys Asn Gly Gly Val Thr Gln Gln Glu Leu Ala Ala Tyr  
3490 3495 3500

Arg Lys Ala Ala Asn Ile Ala Lys Ser Val Phe Asp Arg Asp Leu Ala  
3505 3510 3515 3520

Val Gln Lys Lys Leu Asp Ser Met Ala Glu Arg Ala Met Thr Thr Met  
3525 3530 3535

Tyr Lys Glu Ala Arg Val Thr Asp Arg Arg Ala Lys Leu Val Ser Ser  
3540 3545 3550

Leu His Ala Leu Leu Phe Ser Met Leu Lys Lys Ile Asp Ser Glu Lys  
3555 3560 3565

Leu Asn Val Leu Phe Asp Gln Ala Ser Ser Gly Val Val Pro Leu Ala  
3570 3575 3580

Thr Val Pro Ile Val Cys Ser Asn Lys Leu Thr Leu Val Ile Pro Asp  
3585 3590 3595 3600

Pro Glu Thr Trp Val Lys Cys Val Glu Gly Val His Val Thr Tyr Ser  
3605 3610 3615

Thr Val Val Trp Asn Ile Asp Thr Val Ile Asp Ala Asp Gly Thr Glu  
3620 3625 3630

Leu His Pro Thr Ser Thr Gly Ser Gly Leu Thr Tyr Cys Ile Ser Gly  
3635 3640 3645

Ala Asn Ile Ala Trp Pro Leu Lys Val Asn Leu Thr Arg Asn Gly His  
3650 3655 3660

Asn Lys Val Asp Val Val Leu Gln Asn Asn Glu Leu Met Pro His Gly  
3665 3670 3675 3680

Val Lys Thr Lys Ala Cys Val Ala Gly Val Asp Gln Ala His Cys Ser  
3685 3690 3695

Val Glu Ser Lys Cys Tyr Tyr Thr Asn Ile Ser Gly Asn Ser Val Val  
3700 3705 3710

Ala Ala Ile Thr Ser Ser Asn Pro Asn Leu Lys Val Ala Ser Phe Leu  
3715 3720 3725

Asn Glu Ala Gly Asn Gln Ile Tyr Val Asp Leu Asp Pro Pro Cys Lys  
3730 3735 3740

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Phe Gly Met Lys Val Gly Val Lys Val Glu Val Val Tyr Leu Tyr Phe  
 3745 3750 3755 3760  
 Ile Lys Asn Thr Arg Ser Ile Val Arg Gly Met Val Leu Gly Ala Ile  
 3765 3770 3775  
 Ser Asn Val Val Val Leu Gln Ser Lys Gly His Glu Thr Glu Glu Val  
 3780 3785 3790  
 Asp Ala Val Gly Ile Leu Ser Leu Cys Ser Phe Ala Val Asp Pro Ala  
 3795 3800 3805  
 Asp Thr Tyr Cys Lys Tyr Val Ala Ala Gly Asn Gln Pro Leu Gly Asn  
 3810 3815 3820  
 Cys Val Lys Met Leu Thr Val His Asn Gly Ser Gly Phe Ala Ile Thr  
 3825 3830 3835 3840  
 Ser Lys Pro Ser Pro Thr Pro Asp Gln Asp Ser Tyr Gly Gly Ala Ser  
 3845 3850 3855  
 Val Cys Leu Tyr Cys Arg Ala His Ile Ala His Pro Gly Ser Val Gly  
 3860 3865 3870  
 Asn Leu Asp Gly Arg Cys Gln Phe Lys Gly Ser Phe Val Gln Ile Pro  
 3875 3880 3885  
 Thr Thr Glu Lys Asp Pro Val Gly Phe Cys Leu Arg Asn Lys Val Cys  
 3890 3895 3900  
 Thr Val Cys Gln Cys Trp Ile Gly Tyr Gly Cys Gln Cys Asp Ser Leu  
 3905 3910 3915 3920  
 Arg Gln Pro Lys Ser Ser Val Gln Ser Val Ala Gly Ala Ser Asp Phe  
 3925 3930 3935  
 Asp Lys Asn Tyr Leu Asn Arg Val Arg Gly Ser Ser Glu Ala Arg Leu  
 3940 3945 3950  
 Ile Pro Leu Ala Ser Gly Cys Asp Pro Asp Val Val Lys Arg Ala Phe  
 3955 3960 3965  
 Asp Val Cys Asn Lys Glu Ser Ala Gly Met Phe Gln Asn Leu Lys Arg  
 3970 3975 3980  
 Asn Cys Ala Arg Phe Gln Glu Leu Arg Asp Thr Glu Asp Gly Asn Leu  
 3985 3990 3995 4000  
 Glu Tyr Leu Asp Ser Tyr Phe Val Val Lys Gln Thr Thr Pro Ser Asn  
 4005 4010 4015  
 Tyr Glu His Glu Lys Ser Cys Tyr Glu Asp Leu Lys Ser Glu Val Thr  
 4020 4025 4030  
 Ala Asp His Asp Phe Phe Val Phe Asn Lys Asn Ile Tyr Asn Ile Ser  
 4035 4040 4045  
 Arg Gln Arg Leu Thr Lys Tyr Thr Met Met Asp Phe Cys Tyr Ala Leu  
 4050 4055 4060  
 Arg His Phe Asp Pro Lys Asp Cys Glu Val Leu Lys Glu Ile Leu Val  
 4065 4070 4075 4080

SEQLIST-20480.TXT

Thr Tyr Gly Cys Ile Glu Asp Tyr His Pro Lys Trp Phe Glu Glu Asn  
4085 4090 4095

Lys Asp Trp Tyr Asp Pro Ile Glu Asn Ser Lys Tyr Tyr Val Met Leu  
4100 4105 4110

Ala Lys Met Gly Pro Ile Val Arg Arg Ala Leu Leu Asn Ala Ile Glu  
4115 4120 4125

Phe Gly Asn Leu Met Val Glu Lys Gly Tyr Val Gly Val Ile Thr Leu  
4130 4135 4140

Asp Asn Gln Asp Leu Asn Gly Lys Phe Tyr Asp Phe Gly Asp Phe Gln  
4145 4150 4155 4160

Lys Thr Ala Pro Gly Ala Gly Val Pro Val Phe Asp Thr Tyr Tyr Ser  
4165 4170 4175

Tyr Met Met Pro Ile Ile Ala Met Thr Asp Ala Leu Ala Pro Glu Arg  
4180 4185 4190

Tyr Phe Glu Tyr Asp Val His Lys Gly Tyr Lys Ser Tyr Asp Leu Leu  
4195 4200 4205

Lys Tyr Asp Tyr Thr Glu Glu Lys Gln Glu Leu Phe Gln Lys Tyr Phe  
4210 4215 4220

Lys Tyr Trp Asp Gln Glu Tyr His Pro Asn Cys Arg Asp Cys Ser Asp  
4225 4230 4235 4240

Asp Arg Cys Leu Ile His Cys Ala Asn Phe Asn Ile Leu Phe Ser Thr  
4245 4250 4255

Leu Ile Pro Gln Thr Ser Phe Gly Asn Leu Cys Arg Lys Val Phe Val  
4260 4265 4270

Asp Gly Val Pro Phe Ile Ala Thr Cys Gly Tyr His Ser Lys Glu Leu  
4275 4280 4285

Gly Val Ile Met Asn Gln Asp Asn Thr Met Ser Phe Ser Lys Met Gly  
4290 4295 4300

Leu Ser Gln Leu Met Gln Phe Val Gly Asp Pro Ala Leu Leu Val Gly  
4305 4310 4315 4320

Thr Ser Asn Asn Leu Val Asp Leu Arg Thr Ser Cys Phe Ser Val Cys  
4325 4330 4335

Ala Leu Thr Ser Gly Ile Thr His Gln Thr Val Lys Pro Gly His Phe  
4340 4345 4350

Asn Lys Asp Phe Tyr Asp Phe Ala Glu Lys Ala Gly Met Phe Lys Glu  
4355 4360 4365

Gly Ser Ser Ile Pro Leu Lys His Phe Phe Tyr Pro Gln Thr Gly Asn  
4370 4375 4380

Ala Ala Ile Asn Asp Tyr Asp Tyr Tyr Arg Tyr Asn Arg Pro Thr Met  
4385 4390 4395 4400

Phe Asp Ile Cys Gln Leu Leu Phe Cys Leu Glu Val Thr Ser Lys Tyr  
4405 4410 4415

SEQLIST-20480.TXT

Phe Glu Cys Tyr Glu Gly Gly Cys Ile Pro Ala Ser Gln Val Val Val  
4420 4425 4430

Asn Asn Leu Asp Lys Ser Ala Gly Tyr Pro Phe Asn Lys Phe Gly Lys  
4435 4440 4445

Ala Arg Leu Tyr Tyr Glu Met Ser Leu Glu Glu Gln Asp Gln Leu Phe  
4450 4455 4460

Glu Ile Thr Lys Lys Asn Val Leu Pro Thr Ile Thr Gln Met Asn Leu  
4465 4470 4480

Lys Tyr Ala Ile Ser Ala Lys Asn Arg Ala Arg Thr Val Ala Gly Val  
4485 4490 4495

Ser Ile Leu Ser Thr Met Thr Asn Arg Gln Phe His Gln Lys Ile Leu  
4500 4505 4510

Lys Ser Ile Val Asn Thr Arg Asn Ala Ser Val Val Ile Gly Thr Thr  
4515 4520 4525

Lys Phe Tyr Gly Gly Trp Asp Asn Met Leu Arg Asn Leu Ile Gln Gly  
4530 4535 4540

Val Glu Asp Pro Ile Leu Met Gly Trp Asp Tyr Pro Lys Cys Asp Arg  
4545 4550 4555 4560

Ala Met Pro Asn Leu Leu Arg Ile Ala Ala Ser Leu Val Leu Ala Arg  
4565 4570 4575

Lys His Thr Asn Cys Cys Ser Trp Ser Glu Arg Ile Tyr Arg Leu Tyr  
4580 4585 4590

Asn Glu Cys Ala Gln Val Leu Ser Glu Thr Val Leu Ala Thr Gly Gly  
4595 4600 4605

Ile Tyr Val Lys Pro Gly Gly Thr Ser Ser Gly Asp Ala Thr Thr Ala  
4610 4615 4620

Tyr Ala Asn Ser Val Phe Asn Ile Ile Gln Ala Thr Ser Ala Asn Val  
4625 4630 4635 4640

Ala Arg Leu Leu Ser Val Ile Thr Arg Asp Ile Val Tyr Asp Asn Ile  
4645 4650 4655

Lys Ser Leu Gln Tyr Glu Leu Tyr Gln Gln Val Tyr Arg Arg Val Asn  
4660 4665 4670

Phe Asp Pro Ala Phe Val Glu Lys Phe Tyr Ser Tyr Leu Cys Lys Asn  
4675 4680 4685

Phe Ser Leu Met Ile Leu Ser Asp Asp Gly Val Val Cys Tyr Asn Asn  
4690 4695 4700

Thr Leu Ala Lys Gln Gly Leu Val Ala Asp Ile Ser Gly Phe Arg Glu  
4705 4710 4715 4720

Val Leu Tyr Tyr Gln Asn Asn Val Phe Met Ala Asp Ser Lys Cys Trp  
4725 4730 4735

Val Glu Pro Asp Leu Glu Lys Gly Pro His Glu Phe Cys Ser Gln His  
4740 4745 4750

SEQLIST-20480.TXT

Thr Met Leu Val Glu Val Asp Gly Glu Pro Lys Tyr Leu Pro Tyr Pro  
4755 4760 4765

Asp Pro Ser Arg Ile Leu Gly Ala Cys Val Phe Val Asp Asp Val Asp  
4770 4775 4780

Lys Thr Glu Pro Val Ala Val Met Glu Arg Tyr Ile Ala Leu Ala Ile  
4785 4790 4795 4800

Asp Ala Tyr Pro Leu Val His His Glu Asn Glu Glu Tyr Lys Lys Val  
4805 4810 4815

Phe Phe Val Leu Leu Ala Tyr Ile Arg Lys Leu Tyr Gln Glu Leu Ser  
4820 4825 4830

Gln Asn Met Leu Met Asp Tyr Ser Phe Val Met Asp Ile Asp Lys Gly  
4835 4840 4845

Ser Lys Phe Trp Glu Gln Glu Phe Tyr Glu Asn Met Tyr Arg Ala Pro  
4850 4855 4860

Thr Thr Leu Gln Ser Cys Gly Val Cys Val Val Cys Asn Ser Gln Thr  
4865 4870 4875 4880

Ile Leu Arg Cys Gly Asn Cys Ile Arg Lys Pro Phe Leu Cys Cys Lys  
4885 4890 4895

Cys Cys Tyr Asp His Val Met His Thr Asp His Lys Asn Val Leu Ser  
4900 4905 4910

Ile Asn Pro Tyr Ile Cys Ser Gln Leu Gly Cys Gly Glu Ala Asp Val  
4915 4920 4925

Thr Lys Leu Tyr Leu Gly Gly Met Ser Tyr Phe Cys Gly Asn His Lys  
4930 4935 4940

Pro Lys Leu Ser Ile Pro Leu Val Ser Asn Gly Thr Val Phe Gly Ile  
4945 4950 4955 4960

Tyr Arg Ala Asn Cys Ala Gly Ser Glu Asn Val Asp Asp Phe Asn Gln  
4965 4970 4975

Leu Ala Thr Thr Asn Trp Ser Ile Val Glu Pro Tyr Ile Leu Ala Asn  
4980 4985 4990

Arg Cys Ser Asp Ser Leu Arg Arg Phe Ala Ala Glu Thr Val Lys Ala  
4995 5000 5005

Thr Glu Glu Leu His Lys Gln Gln Phe Ala Ser Ala Glu Val Arg Glu  
5010 5015 5020

Val Phe Ser Asp Arg Glu Leu Ile Leu Ser Trp Glu Pro Gly Lys Thr  
5025 5030 5035 5040

Arg Pro Pro Leu Asn Arg Asn Tyr Val Phe Thr Gly Tyr His Phe Thr  
5045 5050 5055

Arg Thr Ser Lys Val Gln Leu Gly Asp Phe Thr Phe Glu Lys Gly Glu  
5060 5065 5070

Gly Lys Asp Val Val Tyr Tyr Lys Ala Thr Ser Thr Ala Lys Leu Ser  
5075 5080 5085

SEQLIST-20480.TXT

Val Gly Asp Ile Phe Val Leu Thr Ser His Asn Val Val Ser Leu Val  
5090 5095 5100

Ala Pro Thr Leu Cys Pro Gln Gln Thr Phe Ser Arg Phe Val Asn Leu  
5105 5110 5115 5120

Arg Pro Asn Val Met Val Pro Glu Cys Phe Val Asn Asn Ile Pro Leu  
5125 5130 5135

Tyr His Leu Val Gly Lys Gln Lys Arg Thr Thr Val Gln Gly Pro Pro  
5140 5145 5150

Gly Ser Gly Lys Ser His Phe Ala Ile Gly Leu Ala Val Tyr Phe Ser  
5155 5160 5165

Ser Ala Arg Val Val Phe Thr Ala Cys Ser His Ala Ala Val Asp Ala  
5170 5175 5180

Leu Cys Glu Lys Ala Phe Lys Phe Leu Lys Val Asp Asp Cys Thr Arg  
5185 5190 5195 5200

Ile Val Pro Gln Arg Thr Thr Val Asp Cys Phe Ser Lys Phe Lys Ala  
5205 5210 5215

Asn Asp Thr Gly Lys Lys Tyr Ile Phe Ser Thr Ile Asn Ala Leu Pro  
5220 5225 5230

Glu Val Ser Cys Asp Ile Leu Leu Val Asp Glu Val Ser Met Leu Thr  
5235 5240 5245

Asn Tyr Glu Leu Ser Phe Ile Asn Gly Lys Ile Asn Tyr Gln Tyr Val  
5250 5255 5260

Val Tyr Val Gly Asp Pro Ala Gln Leu Pro Ala Pro Arg Thr Leu Leu  
5265 5270 5275 5280

Asn Gly Ser Leu Ser Pro Lys Asp Tyr Asn Val Val Thr Asn Leu Met  
5285 5290 5295

Val Cys Val Lys Pro Asp Ile Phe Leu Ala Lys Cys Tyr Arg Cys Pro  
5300 5305 5310

Lys Glu Ile Val Asp Thr Val Ser Thr Leu Val Tyr Asp Gly Lys Phe  
5315 5320 5325

Ile Ala Asn Asn Pro Glu Ser Arg Glu Cys Phe Lys Val Ile Val Asn  
5330 5335 5340

Asn Gly Asn Ser Asp Val Gly His Glu Ser Gly Ser Ala Tyr Asn Thr  
5345 5350 5355 5360

Thr Gln Leu Glu Phe Val Lys Asp Phe Val Cys Arg Asn Lys Gln Trp  
5365 5370 5375

Arg Glu Ala Ile Phe Ile Ser Pro Tyr Asn Ala Met Asn Gln Arg Ala  
5380 5385 5390

Tyr Arg Met Leu Gly Leu Asn Val Gln Thr Val Asp Ser Ser Gln Gly  
5395 5400 5405

Ser Glu Tyr Asp Tyr Val Ile Phe Cys Val Thr Ala Asp Ser Gln His  
5410 5415 5420

SEQLIST-20480.TXT

Ala Leu Asn Ile Asn Arg Phe Asn Val Ala Leu Thr Arg Ala Lys Arg  
5425 5430 5435 5440

Gly Ile Leu Val Val Met Arg Gln Arg Asp Glu Leu Tyr Ser Ala Leu  
5445 5450 5455

Lys Phe Thr Glu Leu Asp Ser Glu Thr Ser Leu Gln Gly Thr Gly Leu  
5460 5465 5470

Phe Lys Ile Cys Asn Lys Glu Phe Ser Gly Val His Pro Ala Tyr Ala  
5475 5480 5485

Val Thr Thr Lys Ala Leu Ala Ala Thr Tyr Lys Val Asn Asp Glu Leu  
5490 5495 5500

Ala Ala Leu Val Asn Val Glu Ala Gly Ser Glu Ile Thr Tyr Lys His  
5505 5510 5515 5520

Leu Ile Ser Leu Leu Gly Phe Lys Met Ser Val Asn Val Glu Gly Cys  
5525 5530 5535

His Asn Met Phe Ile Thr Arg Asp Glu Ala Ile Arg Asn Val Arg Gly  
5540 5545 5550

Trp Val Gly Phe Asp Val Glu Ala Thr His Ala Cys Gly Thr Asn Ile  
5555 5560 5565

Gly Thr Asn Leu Pro Phe Gln Val Gly Phe Ser Thr Gly Ala Asp Phe  
5570 5575 5580

Val Val Thr Pro Glu Gly Leu Val Asp Thr Ser Ile Gly Asn Asn Phe  
5585 5590 5595 5600

Glu Pro Val Asn Ser Lys Ala Pro Pro Gly Glu Gln Phe Asn His Leu  
5605 5610 5615

Arg Val Leu Phe Lys Ser Ala Lys Pro Trp His Val Ile Arg Pro Arg  
5620 5625 5630

Ile Val Gln Met Leu Ala Asp Asn Leu Cys Asn Val Ser Asp Cys Val  
5635 5640 5645

Val Phe Val Thr Trp Cys His Gly Leu Glu Leu Thr Thr Leu Arg Tyr  
5650 5655 5660

Phe Val Lys Ile Gly Lys Glu Gln Val Cys Ser Cys Gly Ser Arg Ala  
5665 5670 5675 5680

Thr Thr Phe Asn Ser His Thr Gln Ala Tyr Ala Cys Trp Lys His Cys  
5685 5690 5695

Leu Gly Phe Asp Phe Val Tyr Asn Pro Leu Leu Val Asp Ile Gln Gln  
5700 5705 5710

Trp Gly Tyr Ser Gly Asn Leu Gln Phe Asn His Asp Leu His Cys Asn  
5715 5720 5725

Val His Gly His Ala His Val Ala Ser Val Asp Ala Ile Met Thr Arg  
5730 5735 5740

Cys Leu Ala Ile Asn Asn Ala Phe Cys Gln Asp Val Asn Trp Asp Leu  
5745 5750 5755 5760



SEQLIST-20480.TXT

Thr Tyr Pro His Ile Ala Asn Glu Asp Glu Val Asn Ser Ser Cys Arg  
5765 5770 5775

Tyr Leu Gln Arg Met Tyr Leu Asn Ala Cys Val Asp Ala Leu Lys Val  
5780 5785 5790

Asn Val Val Tyr Asp Ile Gly Asn Pro Lys Gly Ile Lys Cys Val Arg  
5795 5800 5805

Arg Gly Asp Val Asn Phe Arg Phe Tyr Asp Lys Asn Pro Ile Val Arg  
5810 5815 5820

Asn Val Lys Gln Phe Glu Tyr Asp Tyr Asn Gln His Lys Asp Lys Phe  
5825 5830 5835 5840

Ala Asp Gly Leu Cys Met Phe Trp Asn Cys Asn Val Asp Cys Tyr Pro  
5845 5850 5855

Asp Asn Ser Leu Val Cys Arg Tyr Asp Thr Arg Asn Leu Ser Val Phe  
5860 5865 5870

Asn Leu Pro Gly Cys Asn Gly Gly Ser Leu Tyr Val Asn Lys His Ala  
5875 5880 5885

Phe Tyr Thr Pro Lys Phe Asp Arg Ile Ser Phe Arg Asn Leu Lys Ala  
5890 5895 5900

Met Pro Phe Phe Phe Tyr Asp Ser Ser Pro Cys Glu Thr Ile Gln Val  
5905 5910 5915 5920

Asp Gly Val Ala Gln Asp Leu Val Ser Leu Ala Thr Lys Asp Cys Ile  
5925 5930 5935

Thr Lys Cys Asn Ile Gly Gly Ala Val Cys Lys Lys His Ala Gln Met  
5940 5945 5950

Tyr Ala Glu Phe Val Thr Ser Tyr Asn Ala Ala Val Thr Ala Gly Phe  
5955 5960 5965

Thr Phe Trp Val Thr Asn Lys Leu Asn Pro Tyr Asn Leu Trp Lys Ser  
5970 5975 5980

Phe Ser Ala Leu Gln Ser Ile Asp Asn Ile Ala Tyr Asn Met Tyr Lys  
5985 5990 5995 6000

Gly Gly His Tyr Asp Ala Ile Ala Gly Glu Met Pro Thr Val Ile Thr  
6005 6010 6015

Gly Asp Lys Val Phe Val Ile Asp Gln Gly Val Glu Lys Ala Val Phe  
6020 6025 6030

Val Asn Gln Thr Thr Leu Pro Thr Ser Val Ala Phe Glu Leu Tyr Ala  
6035 6040 6045

Lys Arg Asn Ile Arg Thr Leu Pro Asn Asn Arg Ile Leu Lys Gly Leu  
6050 6055 6060

Gly Val Asp Val Thr Asn Gly Phe Val Ile Trp Asp Tyr Ala Asn Gln  
6065 6070 6075 6080

Thr Pro Leu Tyr Arg Asn Thr Val Lys Val Cys Ala Tyr Thr Asp Ile  
6085 6090 6095

SEQLIST-20480.TXT

Glu Pro Asn Gly Leu Val Val Leu Tyr Asp Asp Arg Tyr Gly Asp Tyr  
6100 6105 6110

Gln Ser Phe Leu Ala Ala Asp Asn Ala Val Leu Val Ser Thr Gln Cys  
6115 6120 6125

Tyr Lys Arg Tyr Ser Tyr Val Glu Ile Pro Ser Asn Leu Leu Val Gln  
6130 6135 6140

Asn Gly Met Pro Leu Lys Asp Gly Ala Asn Leu Tyr Val Tyr Lys Arg  
6145 6150 6155 6160

Val Asn Gly Ala Phe Val Thr Leu Pro Asn Thr Ile Asn Thr Gln Gly  
6165 6170 6175

Arg Ser Tyr Glu Thr Phe Glu Pro Arg Ser Asp Ile Glu Arg Asp Phe  
6180 6185 6190

Leu Ala Met Ser Glu Glu Ser Phe Val Glu Arg Tyr Gly Lys Asp Leu  
6195 6200 6205

Gly Leu Gln His Ile Leu Tyr Gly Glu Val Asp Lys Pro Gln Leu Gly  
6210 6215 6220

Gly Leu His Thr Val Ile Gly Met Tyr Arg Leu Leu Arg Ala Asn Lys  
6225 6230 6235 6240

Leu Asn Ala Lys Ser Val Thr Asn Ser Asp Ser Asp Val Met Gln Asn  
6245 6250 6255

Tyr Phe Val Leu Ser Asp Asn Gly Ser Tyr Lys Gln Val Cys Thr Val  
6260 6265 6270

Val Asp Leu Leu Leu Asp Asp Phe Leu Glu Leu Leu Arg Asn Ile Leu  
6275 6280 6285

Lys Glu Tyr Gly Thr Asn Lys Ser Lys Val Val Thr Val Ser Ile Asp  
6290 6295 6300

Tyr His Ser Ile Asn Phe Met Thr Trp Phe Glu Asp Gly Ser Ile Lys  
6305 6310 6315 6320

Thr Cys Tyr Pro Gln Leu Gln Ser Ala Trp Thr Cys Gly Tyr Asn Met  
6325 6330 6335

Pro Glu Leu Tyr Lys Val Gln Asn Cys Val Met Glu Pro Cys Asn Ile  
6340 6345 6350

Pro Asn Tyr Gly Val Gly Ile Thr Leu Pro Ser Gly Ile Leu Met Asn  
6355 6360 6365

Val Ala Lys Tyr Thr Gln Leu Cys Gln Tyr Leu Ser Lys Thr Thr Ile  
6370 6375 6380

Cys Val Pro His Asn Met Arg Val Met His Phe Gly Ala Gly Ser Asp  
6385 6390 6395 6400

Lys Gly Val Ala Pro Gly Ser Thr Val Leu Lys Gln Trp Leu Pro Glu  
6405 6410 6415

Gly Thr Leu Leu Val Asp Asn Asp Ile Val Asp Tyr Val Ser Asp Ala  
6420 6425 6430

SEQLIST-20480.TXT

His Val Ser Val Leu Ser Asp Cys Asn Lys Tyr Asn Thr Glu His Lys  
6435 6440 6445

Phe Asp Leu Val Ile Ser Asp Met Tyr Thr Asp Asn Asp Ser Lys Arg  
6450 6455 6460

Lys His Glu Gly Val Ile Ala Asn Asn Gly Asn Asp Asp Val Phe Ile  
6465 6470 6475 6480

Tyr Leu Ser Ser Phe Leu Arg Asn Asn Leu Ala Leu Gly Gly Ser Phe  
6485 6490 6495

Ala Val Lys Val Thr Glu Thr Ser Trp His Glu Val Leu Tyr Asp Ile  
6500 6505 6510

Ala Gln Asp Cys Ala Trp Trp Thr Met Phe Cys Thr Ala Val Asn Ala  
6515 6520 6525

Ser Ser Ser Glu Ala Phe Leu Ile Gly Val Asn Tyr Leu Gly Ala Ser  
6530 6535 6540

Glu Lys Val Lys Val Ser Gly Lys Thr Leu His Ala Asn Tyr Ile Phe  
6545 6550 6555 6560

Trp Arg Asn Cys Asn Tyr Leu Gln Thr Ser Ala Tyr Ser Ile Phe Asp  
6565 6570 6575

Val Ala Lys Phe Asp Leu Arg Leu Lys Ala Thr Pro Val Val Asn Leu  
6580 6585 6590

Lys Thr Glu Gln Lys Thr Asp Leu Val Phe Asn Leu Ile Lys Cys Gly  
6595 6600 6605

Lys Leu Leu Val Arg Asp Val Gly Asn Thr Ser Phe Thr Ser Asp Ser  
6610 6615 6620

Phe Val Cys Thr Met  
6625

<210> 9906  
<211> 409  
<212> PRT  
<213> Avian infectious bronchitis virus

<400> 9906  
Met Ala Ser Gly Lys Ala Ala Gly Lys Ser Asp Ser Pro Ala Pro Ile  
1 5 10 15

Ile Lys Leu Gly Gly Pro Lys Pro Pro Lys Val Gly Ser Ser Gly Asn  
20 25 30

Ala Ser Trp Phe Gln Ala Ile Lys Ala Lys Lys Leu Asn Ala Pro Ala  
35 40 45

Pro Lys Phe Glu Gly Ser Gly Val Pro Asp Asn Glu Asn Leu Lys Asn  
50 55 60

Ser Gln Gln His Gly Tyr Trp Arg Arg Gln Ala Arg Phe Lys Pro Gly  
65 70 75 80

Lys Gly Gly Arg Lys Pro Val Pro Asp Ala Trp Tyr Phe Tyr Tyr Thr  
85 90 95

SEQLIST-20480.TXT

Gly Thr Gly Pro Ala Ala Asp Leu Asn Trp Gly Asp Ser Gln Asp Gly  
100 105 110  
Ile Val Trp Val Ala Ala Lys Gly Ala Asp Val Lys Ser Arg Ser Asn  
115 120 125  
Gln Gly Thr Arg Asp Pro Asp Lys Phe Asp Gln Tyr Pro Leu Arg Phe  
130 135 140  
Ser Asp Gly Gly Pro Asp Gly Asn Phe Arg Trp Asp Phe Ile Pro Leu  
145 150 155 160  
Ser Arg Gly Arg Ser Gly Arg Ser Thr Ala Ala Ser Ser Ala Ala Ser  
165 170 175  
Ser Arg Val Pro Ser Arg Glu Gly Ser Arg Gly Arg Arg Ser Gly Ala  
180 185 190  
Glu Asp Asp Leu Ile Ala Arg Ala Ala Lys Ile Ile Gln Asp Gln Gln  
195 200 205  
Arg Lys Gly Thr Arg Ile Thr Lys Gln Lys Ala Glu Glu Met Ala His  
210 215 220  
Arg Arg Phe Cys Lys Arg Thr Val Pro Pro Gly Tyr Arg Val Asp Gln  
225 230 235 240  
Val Phe Gly Pro Arg Thr Lys Gly Lys Glu Gly Asn Phe Gly Asp Asp  
245 250 255  
Lys Met Asn Glu Glu Gly Ile Lys Asp Gly Arg Val Thr Ala Met Leu  
260 265 270  
Asn Leu Thr Pro Ser Pro His Ala Cys Leu Phe Gly Ser Arg Val Thr  
275 280 285  
Pro Lys Leu Gln Pro Asp Gly Leu His Leu Arg Phe Glu Phe Thr Thr  
290 295 300  
Val Val Pro Arg Asp Asp Pro Gln Phe Asp Asn Tyr Val Lys Ile Cys  
305 310 315 320  
Asp Glu Cys Val Asp Gly Val Gly Thr Arg Pro Lys Asp Glu Val Val  
325 330 335  
Arg Pro Lys Ser Arg Pro Asn Ser Arg Pro Ala Thr Arg Thr Ser Ser  
340 345 350  
Pro Ala Pro Arg Gln Gln Arg Gln Lys Lys Glu Lys Lys Ser Lys Lys  
355 360 365  
Gln Asp Asp Glu Val Asp Lys Ala Leu Thr Ser Asp Glu Glu Arg Asn  
370 375 380  
Asn Ala Gln Leu Glu Phe Asp Asp Glu Pro Lys Val Ile Asn Trp Gly  
385 390 395 400  
Asp Ser Ala Leu Gly Glu Asn Glu Leu  
405

<210> 9907  
<211> 108  
<212> PRT

<213> Avian infectious bronchitis virus

<400> 9907

Met Asn Leu Leu Asn Lys Ser Leu Glu Glu Asn Gly Ser Phe Leu Thr  
1 5 10 15  
Ala Leu Tyr Ile Ile Val Gly Phe Leu Ala Leu Tyr Leu Leu Gly Arg  
20 25 30  
Ala Leu Gln Ala Phe Val Gln Ala Ala Asp Ala Cys Cys Leu Phe Trp  
35 40 45  
Tyr Thr Trp Val Val Ile Pro Gly Ala Lys Gly Thr Ala Phe Val Tyr  
50 55 60  
Lys Tyr Thr Tyr Gly Arg Lys Leu Asn Asn Pro Glu Leu Glu Ala Val  
65 70 75 80  
Ile Val Asn Glu Phe Pro Lys Asn Gly Trp Asn Asn Lys Asn Pro Ala  
85 90 95  
Asn Phe Gln Asp Ala Gln Arg Asp Lys Leu Tyr Ser  
100 105

<210> 9908

<211> 200

<212> PRT

<213> Avian infectious bronchitis virus

<400> 9908

Met Ser Asn Ala Ala Asn Cys Thr Leu Asp Cys Glu Gln Ser Val Glu  
1 5 10 15  
Leu Phe Lys Glu Tyr Asn Leu Phe Ile Thr Ala Phe Leu Leu Phe Leu  
20 25 30  
Thr Ile Leu Leu Gln Tyr Gly Tyr Ala Thr Arg Ser Arg Phe Ile Tyr  
35 40 45  
Ile Met Lys Met Ile Val Leu Trp Cys Phe Trp Pro Leu Asn Ile Ala  
50 55 60  
Val Gly Val Ile Ser Cys Ile Tyr Pro Pro Asn Thr Gly Gly Leu Val  
65 70 75 80  
Ala Ala Lys Ile Leu Thr Val Val Ala Cys Leu Ser Phe Glu Gly Tyr  
85 90 95  
Trp Ile Gln Ser Ile Arg Leu Phe Lys Arg Gly Gly Gln Trp Trp Ala  
100 105 110  
Phe Asn Pro Glu Ser Asn Ala Val Gly Ser Ile Leu Leu Ser Asn Gly  
115 120 125  
Gln Gln Cys Asn Phe Ala Ile Glu Ser Val Pro Met Val Leu Ser Pro  
130 135 140  
Ile Ile Lys Asn Gly Val Leu Tyr Cys Glu Gly Gln Trp Leu Ala Lys  
145 150 155 160  
Cys Glu Pro Asp His Leu Pro Lys Asp Ile Phe Val Cys Pro Pro Asp  
165 170 175

SEQLIST-20480.TXT

Arg Arg Asn Ile Tyr Arg Met Val Gln Lys Tyr Thr Gly Asp Gln Ser  
180 185 190

Gly Asn Lys Lys Arg Phe Ala Thr  
195 200

<210> 9909  
<211> 1162  
<212> PRT  
<213> Avian infectious bronchitis virus

<400> 9909  
Met Leu Val Thr Pro Leu Leu Leu Val Thr Leu Leu Cys Ala Leu Cys  
1 5 10 15

Ser Ala Val Leu Tyr Asp Ser Ser Ser Tyr Val Tyr Tyr Tyr Gln Ser  
20 25 30

Ala Phe Arg Pro Pro Ser Gly Trp His Leu Gln Gly Gly Ala Tyr Ala  
35 40 45

Val Val Asn Ile Ser Ser Glu Phe Asn Asn Ala Gly Ser Ser Ser Gly  
50 55 60

Cys Thr Val Gly Ile Ile His Gly Gly Arg Val Val Asn Ala Ser Ser  
65 70 75 80

Ile Ala Met Thr Ala Pro Ser Ser Gly Met Ala Trp Ser Ser Ser Gln  
85 90 95

Phe Cys Thr Ala His Cys Asn Phe Ser Asp Thr Thr Val Phe Val Thr  
100 105 110

His Cys Tyr Lys His Gly Gly Cys Pro Leu Thr Gly Met Leu Gln Gln  
115 120 125

Asn Leu Ile Arg Val Ser Ala Met Lys Asn Gly Gln Leu Phe Tyr Asn  
130 135 140

Leu Thr Val Ser Val Ala Lys Tyr Pro Thr Phe Arg Ser Phe Gln Cys  
145 150 155 160

Val Asn Asn Leu Thr Ser Val Tyr Leu Asn Gly Asp Leu Val Tyr Thr  
165 170 175

Ser Asn Glu Thr Ile Asp Val Thr Ser Ala Gly Val Tyr Phe Lys Ala  
180 185 190

Gly Gly Pro Ile Thr Tyr Lys Val Met Arg Glu Val Lys Ala Leu Ala  
195 200 205

Tyr Phe Val Asn Gly Thr Ala Gln Asp Val Ile Leu Cys Asp Gly Ser  
210 215 220

Pro Arg Gly Leu Leu Ala Cys Gln Tyr Asn Thr Gly Asn Phe Ser Asp  
225 230 235 240

Gly Phe Tyr Pro Phe Thr Asn Ser Ser Leu Val Lys Gln Lys Phe Ile  
245 250 255

Val Tyr Arg Glu Asn Ser Val Asn Thr Thr Cys Thr Leu His Asn Phe  
260 265 270

SEQLIST-20480.TXT

Ile Phe His Asn Glu Thr Gly Ala Asn Pro Asn Pro Ser Gly Val Gln  
275 280 285

Asn Ile Gln Thr Tyr Gln Thr Lys Thr Ala Gln Ser Gly Tyr Tyr Asn  
290 295 300

Phe Asn Phe Ser Phe Leu Ser Ser Phe Val Tyr Lys Glu Ser Asn Phe  
305 310 315 320

Met Tyr Gly Ser Tyr His Pro Ser Cys Lys Phe Arg Leu Glu Thr Ile  
325 330 335

Asn Asn Gly Leu Trp Phe Asn Ser Leu Ser Val Ser Ile Ala Tyr Gly  
340 345 350

Pro Leu Gln Gly Gly Cys Lys Gln Ser Val Phe Lys Gly Arg Ala Thr  
355 360 365

Cys Cys Tyr Ala Tyr Ser Tyr Gly Gly Pro Ser Leu Cys Lys Gly Val  
370 375 380

Tyr Ser Gly Glu Leu Asp His Asn Phe Glu Cys Gly Leu Leu Val Tyr  
385 390 395 400

Val Thr Lys Ser Gly Gly Ser Arg Ile Gln Thr Ala Thr Glu Pro Pro  
405 410 415

Val Ile Thr Gln Asn Asn Tyr Asn Asn Ile Thr Leu Asn Thr Cys Val  
420 425 430

Asp Tyr Asn Ile Tyr Gly Arg Thr Gly Gln Gly Phe Ile Thr Asn Val  
435 440 445

Thr Asp Ser Ala Val Ser Tyr Asn Tyr Leu Ala Asp Ala Gly Leu Ala  
450 455 460

Ile Leu Asp Thr Ser Gly Ser Ile Asp Ile Phe Val Val Gln Gly Glu  
465 470 475 480

Tyr Gly Leu Asn Tyr Tyr Lys Val Asn Pro Cys Glu Asp Val Asn Gln  
485 490 495

Gln Phe Val Val Ser Gly Gly Lys Leu Val Gly Ile Leu Thr Ser Arg  
500 505 510

Asn Glu Thr Gly Ser Gln Leu Leu Glu Asn Gln Phe Tyr Ile Lys Ile  
515 520 525

Thr Asn Gly Thr Arg Arg Phe Arg Arg Ser Ile Thr Glu Asn Val Ala  
530 535 540

Asn Cys Pro Tyr Val Ser Tyr Gly Lys Phe Cys Ile Lys Pro Asp Gly  
545 550 555 560

Ser Ile Ala Thr Ile Val Pro Lys Gln Leu Glu Gln Phe Val Ala Pro  
565 570 575

Leu Phe Asn Val Thr Glu Asn Val Leu Ile Pro Asn Ser Phe Asn Leu  
580 585 590

Thr Val Thr Asp Glu Tyr Ile Gln Thr Arg Met Asp Lys Val Gln Ile  
595 600 605

SEQLIST-20480.TXT

Asn Cys Leu Gln Tyr Val Cys Gly Ser Ser Leu Asp Cys Arg Lys Leu  
 610 615 620  
 Phe Gln Gln Tyr Gly Pro Val Cys Asp Asn Ile Leu Ser Val Val Asn  
 625 630 635 640  
 Ser Val Gly Gln Lys Glu Asp Met Glu Leu Leu Asn Phe Tyr Ser Ser  
 645 650 655  
 Thr Lys Pro Ala Gly Phe Asn Thr Pro Val Leu Ser Asn Val Ser Thr  
 660 665 670  
 Gly Glu Phe Asn Ile Ser Leu Leu Thr Asn Pro Ser Ser Arg Arg  
 675 680 685  
 Lys Arg Ser Leu Ile Glu Asp Leu Leu Phe Thr Ser Val Glu Ser Val  
 690 695 700  
 Gly Leu Pro Thr Asn Asp Ala Tyr Lys Asn Cys Thr Ala Gly Pro Leu  
 705 710 715 720  
 Gly Phe Phe Lys Asp Leu Ala Cys Ala Arg Glu Tyr Asn Gly Leu Leu  
 725 730 735  
 Val Leu Pro Pro Ile Ile Thr Ala Glu Met Gln Ala Leu Tyr Thr Ser  
 740 745 750  
 Ser Leu Val Ala Ser Met Ala Phe Gly Gly Ile Thr Ala Ala Gly Ala  
 755 760 765  
 Ile Pro Phe Ala Thr Gln Leu Gln Ala Arg Ile Asn His Leu Gly Ile  
 770 775 780  
 Thr Gln Ser Leu Leu Leu Lys Asn Gln Glu Lys Ile Ala Ala Ser Phe  
 785 790 795 800  
 Asn Lys Ala Ile Gly His Met Gln Glu Gly Phe Arg Ser Thr Ser Leu  
 805 810 815  
 Ala Leu Gln Gln Ile Gln Asp Val Val Ser Lys Gln Ser Ala Ile Leu  
 820 825 830  
 Thr Glu Thr Met Ala Ser Leu Asn Lys Asn Phe Gly Ala Ile Ser Ser  
 835 840 845  
 Val Ile Gln Glu Ile Tyr Gln Gln Phe Asp Ala Ile Gln Ala Asn Ala  
 850 855 860  
 Gln Val Asp Arg Leu Ile Thr Gly Arg Leu Ser Ser Leu Ser Val Leu  
 865 870 875 880  
 Ala Ser Ala Lys Gln Ala Glu Tyr Ile Arg Val Ser Gln Gln Arg Glu  
 885 890 895  
 Leu Ala Thr Gln Lys Ile Asn Glu Cys Val Lys Ser Gln Ser Ile Arg  
 900 905 910  
 Tyr Ser Phe Cys Gly Asn Gly Arg His Val Leu Thr Ile Pro Gln Asn  
 915 920 925  
 Ala Pro Asn Gly Ile Val Phe Ile His Phe Ser Tyr Thr Pro Asp Ser  
 930 935 940



SEQLIST-20480.TXT

Phe Val Asn Val Thr Ala Ile Val Gly Phe Cys Val Lys Pro Ala Asn  
945 950 955 960

Ala Ser Gln Tyr Ala Ile Val Pro Ala Asn Gly Arg Gly Ile Phe Ile  
965 970 975

Gln Val Asn Gly Ser Tyr Tyr Ile Thr Ala Arg Asp Met Tyr Met Pro  
980 985 990

Arg Ala Ile Thr Ala Gly Asp Val Val Thr Leu Thr Ser Cys Gln Ala  
995 1000 1005

Asn Tyr Val Ser Val Asn Lys Thr Val Ile Thr Thr Phe Val Asp Asn  
1010 1015 1020

Asp Asp Phe Asp Phe Asn Asp Glu Leu Ser Lys Trp Trp Asn Asp Thr  
1025 1030 1035 1040

Lys His Glu Leu Pro Asp Phe Asp Lys Phe Asn Tyr Thr Val Pro Ile  
1045 1050 1055

Leu Asp Ile Asp Ser Glu Ile Asp Arg Ile Gln Gly Val Ile Gln Gly  
1060 1065 1070

Leu Asn Asp Ser Leu Ile Asp Leu Glu Lys Leu Ser Ile Leu Lys Thr  
1075 1080 1085

Tyr Ile Lys Trp Pro Trp Tyr Val Trp Leu Ala Ile Ala Phe Ala Thr  
1090 1095 1100

Ile Ile Phe Ile Leu Ile Leu Gly Trp Val Phe Phe Met Thr Gly Cys  
1105 1110 1115 1120

Cys Gly Cys Cys Cys Gly Cys Phe Gly Ile Met Pro Leu Met Ser Lys  
1125 1130 1135

Cys Gly Lys Lys Ser Ser Tyr Tyr Thr Thr Phe Asp Asn Asp Val Val  
1140 1145 1150

Thr Glu Gln Tyr Arg Pro Lys Lys Ser Val  
1155 1160

<210> 9910  
<211> 371  
<212> DNA  
<213> Avian infectious bronchitis virus

<400> 9910  
tattaaaatc ttattgttgc tggatcact gcttgttttg ccgtgtctca ctttatacat 60  
ctgttgcttg ggctacctag tgtccagcgt cctacgggcg tcgtggctgg ttcgagtgcg 120  
aggaacctct ggttcatcta gcggtaggcg ggtgtgtgga agtagcactt cagacgtacc 180  
ggttctgttg tgtgaaatac ggggtcacct cccccacat acctctaagg gcttttgagc 240  
ctagcgttgg gctacgttct cgcataaggc cggctatacg acgtttgtag ggggtagtgc 300  
caaacaaccc ctgaggtgac aggttctggt ggtgtttagt gagcagacat acaatagaca 360  
gtgacaacat g 371

<210> 9911  
<211> 506  
<212> DNA  
<213> Avian infectious bronchitis virus

<400> 9911  
gtaacataat ggacctgttg tttcctggta cattttgtta aacactatct ctgtgctttc 60

SEQLIST-20480.TXT						
ctatcaatta	ttacaggcat	tgattgtgat	tatgtttcaat	acttaagctt	cttttggttg	120
ctttttgctt	attgtattgt	tgctgtgctt	tttattgttg	tgattctcat	tagtttgctt	180
tatcgtagaa	attcaatagt	aagagttaag	gaagataggc	atgtagcttg	attacctaca	240
tgtctatcgc	cagggaaatg	tctaattctgt	ctacttagta	gcctggaaac	gaacggtaga	300
cccttagact	ttaattttagt	ttaatttttta	gttttagttt	agttagttta	gagtaggtat	360
aaagatgcca	gtgccggggc	cacgcggagt	acgatcgagg	gtacagcact	aggacgcca	420
ttaggggaag	agctaaattt	tagtttaagt	taagtttaat	tggctaagta	tagttaaaat	480
ttataggcta	gtatagagtt	agagca				506

<210> 9912  
 <211> 737  
 <212> DNA  
 <213> Human coronavirus OC43

<400> 9912						
gatgtggatg	acgttttaggt	aatccaaaca	ttatgagtag	taaaactact	ccagcaccag	60
tttataatctg	gactgctgat	gaagctatta	aattcctaaa	ggaatggaat	ttttctttgg	120
gtattataact	actttttatt	acaatcatat	tgcaattttg	atatacaagt	cgcagtatgt	180
ttgtttatgt	tattaagatg	attatttttgt	ggcttatgtg	gccccctact	ataatcttaa	240
ctatttttcaa	ttgctgtatac	gcattgaata	atgtgtatct	tggcctttct	atagttttta	300
ccatagtggc	cattattatg	tggattgtgt	attttgtgaa	tagtatcagg	ttgtttatta	360
gaactggaag	tttttgaggt	ttcaaccag	aaacaaacaa	cttgatgtgt	atagatatga	420
aaggaacaat	gtatgtagg	ccgataattg	aggactatca	tactctgacg	gtcacaataa	480
tacgcggcca	tctttacatt	caagggtataa	aactagggtac	tggctattct	tgggcagatt	540
tgccagctta	tatgactgtt	gctaagggtta	cacacctgtg	cacatataag	cgtgggtttc	600
ttgacaggat	aagcgatact	agtgggtttg	ctgtttatgt	taagtccaaa	gtcggtaatt	660
accgactgcc	atcaacccaa	aagggttctg	gcatggacac	cgcattgttg	agaaataata	720
tctaaatttt	aaggatg					737

<210> 9913  
 <211> 1304  
 <212> DNA  
 <213> Human coronavirus OC43

<400> 9913						
ctaaactcag	tgaaaatggt	tttgcttcct	agattttattc	tagttagctg	cataattggt	60
agcttaggtt	tttacaaccc	tcctaccaat	gttgtttcgc	atgtaaatgg	agattgggtt	120
ttatttggtg	acagtcgttc	agattgtaat	catattgtta	atatcaaccc	ccataattat	180
tcttatatgg	accttaatcc	tgttctgtgt	gattctggta	aaatatcatc	taaagctggc	240
aactccattt	ttaggagttt	tcacttttacc	gattttttata	attacacagg	cgaagggtcaa	300
caaattattt	tttatgaggg	tgtaattttt	acgccttatc	atgcctttta	atgcaaccgt	360
tctgttagta	atgatatttg	gatgcagaat	aaaggcttgt	tttatactca	ggtttataag	420
aatatggctg	tgtatcgcag	ccttactttt	gttaatgtac	catatgttta	taatggctct	480
gcacaatcta	cagctctttg	taaaatctgg	agtttagtcc	ttaataaccc	tgcatatata	540
gctcctcaag	ctaactctgg	ggattattat	tataagggtg	aagctgattt	ttattttgtca	600
ggttgtgacg	agtatatcgt	accactttgt	attttttaacg	gcaagttttt	gtcgaatata	660
aagtattatg	atgatagtca	atattatttt	aataaagaca	ctgggtgttat	ttatggctct	720
aattctacag	aaaccattac	cactgggttt	gatcttaatt	gttattattt	agttttaccc	780
tctggtaatt	atthagccat	ttcaaatgag	ctattgttaa	ctgttcctac	gaaagcaatc	840
tgtcttaata	agcgtaaggga	ttttacgcct	gtacagggtg	ttgattcgcg	gtggaacaat	900
gccaggcagt	ctgataacat	gacggcgggt	gcttgtaaac	ctccgtactg	ttattttcgt	960
aattctacta	ccaactatgt	tgggtgtttat	gatattaatc	atggagatgc	tggttttact	1020
agcatactta	gtggtttgtt	atataattca	ccttgttttt	gcagcaagg	cgttttttagg	1080
tatgataatg	ttagcagtgt	ctggcctctc	tacccttatg	gcagatgtcc	cactgctgct	1140
gatattaata	accctgattt	acccatttgt	gtgtatgatc	cgctaccagt	tattttgctt	1200
ggcattcttt	tgggcgttgc	ggtcataatt	attgtagttt	tggtgttata	ttttatgggtg	1260
gataatggta	ctaggctgca	tgatgcttag	accataatct	aaac		1304

<210> 9914  
 <211> 6758  
 <212> PRT  
 <213> Human coronavirus OC43

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<400> 9914

Met Ala Cys Asn Arg Val Thr Leu Ala Val Ala Ser Asp Ser Glu Ile  
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Ser Ala Asn Gly Cys Ser Thr Ile Ala Gln Ala Val Arg Arg Tyr Ser  
20 25 30  
Glu Ala Ala Ser Asn Gly Phe Arg Ala Cys Arg Phe Val Ser Leu Asp  
35 40 45  
Leu Gln Asp Cys Ile Val Gly Ile Ala Asp Asp Thr Tyr Val Met Gly  
50 55 60  
Leu His Gly Asn Gln Thr Leu Phe Cys Asn Ile Met Lys Phe Ser Asp  
65 70 75 80  
Arg Pro Phe Met Leu His Gly Trp Leu Val Phe Ser Asn Ser Asn Tyr  
85 90 95  
Leu Leu Glu Glu Phe Asp Val Val Phe Gly Lys Arg Gly Gly Gly Asn  
100 105 110  
Val Thr Tyr Thr Asp Gln Tyr Leu Cys Gly Ala Asp Gly Lys Pro Val  
115 120 125  
Met Ser Glu Asp Leu Trp Gln Phe Val Asp His Phe Gly Glu Asn Glu  
130 135 140  
Glu Ile Ile Ile Asn Gly His Thr Tyr Val Cys Ala Trp Leu Thr Lys  
145 150 155 160  
Arg Lys Pro Leu Asp Tyr Lys Arg Gln Asn Asn Leu Ala Ile Glu Glu  
165 170 175  
Ile Glu Tyr Val His Gly Asp Ala Leu His Thr Leu Arg Asn Gly Ser  
180 185 190  
Val Leu Glu Met Ala Lys Glu Val Lys Thr Ser Ser Lys Val Val Leu  
195 200 205  
Ser Asp Ala Leu Asp Lys Leu Tyr Lys Val Phe Gly Ser Pro Val Met  
210 215 220  
Thr Asn Gly Ser Asn Ile Leu Glu Ala Phe Thr Lys Pro Val Phe Ile  
225 230 235 240  
Ser Ala Leu Val Gln Cys Thr Cys Gly Thr Lys Ser Trp Ser Val Gly  
245 250 255  
Asp Trp Thr Gly Phe Lys Ser Ser Cys Cys Asn Val Ile Ser Asn Lys  
260 265 270  
Leu Cys Val Val Pro Gly Asn Val Lys Pro Gly Asp Ala Val Ile Thr  
275 280 285  
Thr Gln Gln Ala Gly Ala Gly Ile Lys Tyr Phe Cys Gly Met Thr Leu  
290 295 300  
Lys Phe Val Ala Asn Ile Glu Gly Val Ser Val Trp Arg Val Ile Ala  
305 310 315 320  
Leu Gln Ser Val Asp Cys Phe Val Ala Ser Ser Thr Phe Val Glu Glu  
325 330 335

SEQLIST-20480.TXT

Glu His Val Asn Arg Met Asp Thr Phe Cys Phe Asn Val Arg Asn Ser  
 340 345 350  
 Val Thr Asp Glu Cys Arg Leu Ala Met Leu Gly Ala Glu Met Thr Ser  
 355 360 365  
 Asn Val Arg Arg Gln Val Ala Ser Gly Val Ile Asp Ile Ser Thr Gly  
 370 375 380  
 Trp Phe Asp Val Tyr Asp Asp Ile Phe Ala Glu Ser Lys Pro Trp Phe  
 385 390 395 400  
 Val Arg Lys Ala Glu Asp Ile Phe Gly Pro Cys Trp Ser Ala Leu Ala  
 405 410 415  
 Ser Ala Leu Lys Gln Leu Lys Val Thr Thr Gly Glu Leu Val Arg Phe  
 420 425 430  
 Val Lys Ser Ile Cys Asn Ser Ala Val Ala Val Val Gly Gly Thr Ile  
 435 440 445  
 Gln Ile Leu Ala Ser Val Pro Glu Lys Phe Leu Asn Ala Phe Asp Val  
 450 455 460  
 Phe Val Thr Ala Ile Gln Thr Val Phe Asp Cys Ala Val Glu Thr Cys  
 465 470 475 480  
 Thr Ile Ala Gly Lys Ala Phe Asp Lys Val Phe Asp Tyr Val Leu Leu  
 485 490 495  
 Asp Asn Ala Leu Val Lys Leu Val Thr Thr Lys Leu Lys Gly Val Arg  
 500 505 510  
 Glu Arg Gly Leu Asn Lys Val Lys Tyr Ala Thr Val Val Val Gly Ser  
 515 520 525  
 Thr Glu Glu Val Lys Ser Ser Arg Val Glu Arg Ser Thr Ala Val Leu  
 530 535 540  
 Thr Ile Ala Asn Asn Tyr Ser Lys Leu Phe Asp Glu Gly Tyr Thr Val  
 545 550 555 560  
 Val Ile Gly Asp Val Ala Tyr Phe Val Ser Asp Gly Tyr Phe Arg Leu  
 565 570 575  
 Met Ala Ser Pro Asn Ser Val Leu Thr Thr Ala Val Tyr Lys Pro Leu  
 580 585 590  
 Phe Ala Phe Asn Val Asn Val Met Gly Thr Arg Pro Glu Lys Phe Pro  
 595 600 605  
 Thr Thr Val Thr Cys Glu Asn Leu Glu Ser Ala Val Leu Phe Val Asn  
 610 615 620  
 Asp Lys Ile Thr Glu Phe Gln Leu Asp Tyr Ser Ile Asp Val Ile Asp  
 625 630 635 640  
 Asn Glu Ile Ile Val Lys Pro Asn Ile Ser Leu Cys Val Pro Leu Tyr  
 645 650 655  
 Val Arg Asp Tyr Val Asp Lys Trp Asp Asp Phe Cys Arg Gln Tyr Ser  
 660 665 670

SEQLIST-20480.TXT

Asn Glu Ser Trp Phe Glu Asp Asp Tyr Arg Ala Phe Ile Ser Val Leu  
 675 680 685  
 Asp Ile Thr Asp Ala Ala Val Lys Ala Ala Glu Ser Lys Ala Phe Val  
 690 700  
 Asp Thr Ile Val Pro Pro Cys Pro Ser Ile Leu Lys Val Ile Asp Gly  
 705 710 715 720  
 Gly Lys Ile Trp Asn Gly Val Ile Lys Asn Val Asn Ser Val Arg Asp  
 725 730 735  
 Trp Leu Lys Ser Leu Lys Leu Asn Leu Thr Gln Gln Gly Leu Leu Gly  
 740 745 750  
 Thr Cys Ala Lys Arg Phe Lys Arg Trp Leu Gly Ile Leu Leu Glu Ala  
 755 760 765  
 Tyr Asn Ala Phe Leu Asp Thr Val Val Ser Thr Val Lys Ile Gly Gly  
 770 775 780  
 Leu Thr Phe Lys Thr Tyr Ala Phe Asp Lys Pro Tyr Ile Val Ile Arg  
 785 790 795 800  
 Asp Ile Val Cys Lys Val Glu Asn Lys Thr Glu Ala Glu Trp Ile Glu  
 805 810 815  
 Leu Phe Pro His Asn Asp Arg Ile Lys Ser Phe Ser Thr Phe Glu Ser  
 820 825 830  
 Ala Tyr Met Pro Ile Ala Asp Pro Thr His Phe Asp Ile Glu Glu Val  
 835 840 845  
 Glu Leu Leu Asp Ala Glu Phe Val Glu Pro Gly Cys Gly Gly Ile Leu  
 850 855 860  
 Ala Val Ile Asp Glu His Val Phe Tyr Lys Lys Asp Gly Val Tyr Tyr  
 865 870 875 880  
 Pro Ser Asn Gly Thr Asn Ile Leu Pro Val Ala Phe Thr Lys Ala Ala  
 885 890 895  
 Gly Gly Lys Val Ser Phe Ser Asp Asp Val Glu Val Lys Asp Ile Glu  
 900 905 910  
 Pro Val Tyr Arg Val Lys Leu Cys Phe Glu Phe Glu Asp Glu Lys Leu  
 915 920 925  
 Val Asp Val Cys Glu Lys Ala Ile Gly Lys Lys Ile Lys His Glu Gly  
 930 935 940  
 Asp Trp Asp Ser Phe Cys Lys Thr Ile Gln Ser Ala Leu Ser Val Val  
 945 950 955 960  
 Ser Cys Tyr Val Asn Leu Pro Thr Tyr Tyr Ile Tyr Asp Glu Glu Gly  
 965 970 975  
 Gly Asn Asp Leu Ser Leu Pro Val Met Ile Ser Glu Trp Pro Leu Ser  
 980 985 990  
 Val Gln Gln Ala Gln Gln Glu Ala Thr Leu Pro Asp Ile Ala Glu Asp  
 995 1000 1005

SEQLIST-20480.TXT

Val Val Asp Gln Val Glu Glu Val Asn Ser Ile Phe Asp Ile Glu Thr  
1010 1015 1020

Val Asp Val Lys His Asp Val Ser Pro Phe Glu Met Pro Phe Glu Glu  
1025 1030 1035 1040

Leu Asn Gly Leu Lys Ile Leu Lys Gln Leu Asp Asn Asn Cys Trp Val  
1045 1050 1055

Asn Ser Val Met Leu Gln Ile Gln Leu Thr Gly Ile Leu Asp Gly Asp  
1060 1065 1070

Tyr Ala Met Gln Phe Phe Lys Met Gly Arg Val Ala Lys Met Ile Glu  
1075 1080 1085

Arg Cys Tyr Thr Ala Glu Gln Cys Ile Arg Gly Ala Met Gly Asp Val  
1090 1095 1100

Gly Leu Cys Met Tyr Arg Leu Leu Lys Asp Leu His Thr Gly Phe Met  
1105 1110 1115 1120

Val Met Asp Tyr Lys Cys Ser Cys Thr Ser Gly Arg Leu Glu Glu Ser  
1125 1130 1135

Gly Ala Val Leu Phe Cys Thr Pro Thr Lys Lys Ala Phe Pro Tyr Gly  
1140 1145 1150

Thr Cys Leu Asn Cys Asn Ala Pro Arg Met Cys Thr Ile Arg Gln Leu  
1155 1160 1165

Gln Gly Thr Ile Ile Phe Val Gln Gln Lys Pro Glu Pro Val Asn Pro  
1170 1175 1180

Val Ser Phe Val Val Lys Pro Val Cys Ser Ser Ile Phe Arg Gly Ala  
1185 1190 1195 1200

Val Ser Cys Gly His Tyr Gln Thr Asn Ile Tyr Ser Gln Asn Leu Cys  
1205 1210 1215

Val Asp Gly Phe Gly Val Asn Lys Ile Gln Pro Trp Thr Asn Asp Ala  
1220 1225 1230

Leu Asn Thr Ile Cys Ile Lys Asp Ala Asp Tyr Asn Ala Lys Val Glu  
1235 1240 1245

Ile Ser Val Thr Pro Ile Lys Asn Thr Val Asp Thr Thr Pro Lys Glu  
1250 1255 1260

Glu Phe Val Val Lys Glu Lys Leu Asn Ala Phe Leu Val His Asp Asn  
1265 1270 1275 1280

Val Ala Phe Tyr Gln Gly Asp Val Asp Thr Val Val Asn Gly Val Asp  
1285 1290 1295

Phe Asp Phe Ile Val Asn Ala Ala Asn Glu Asn Leu Ala His Gly Gly  
1300 1305 1310

Gly Leu Ala Lys Ala Leu Asp Val Tyr Thr Lys Gly Lys Leu Gln Arg  
1315 1320 1325

Leu Ser Lys Glu His Ile Gly Leu Ala Gly Lys Val Lys Val Gly Thr  
1330 1335 1340

SEQLIST-20480.TXT

Gly Val Met Val Glu Cys Asp Ser Leu Arg Ile Phe Asn Val Val Gly  
1345 1350 1355 1360

Pro Arg Lys Gly Lys His Glu Arg Asp Leu Leu Ile Lys Ala Tyr Asn  
1365 1370 1375

Thr Ile Asn Asn Glu Gln Gly Thr Pro Leu Thr Pro Ile Leu Ser Cys  
1380 1385 1390

Gly Ile Phe Gly Ile Lys Leu Glu Thr Ser Leu Glu Val Leu Leu Asp  
1395 1400 1405

Val Cys Asn Thr Lys Glu Val Lys Val Phe Val Tyr Thr Asp Thr Glu  
1410 1415 1420

Val Cys Lys Val Lys Asp Phe Val Ser Gly Leu Val Asn Val Gln Lys  
1425 1430 1435 1440

Val Glu Gln Pro Lys Ile Glu Pro Lys Pro Val Ser Val Ile Lys Val  
1445 1450 1455

Ala Pro Lys Pro Tyr Arg Val Asp Gly Lys Phe Ser Tyr Phe Thr Glu  
1460 1465 1470

Asp Leu Leu Cys Val Ala Asp Asp Lys Pro Ile Val Leu Phe Thr Asp  
1475 1480 1485

Ser Met Leu Thr Leu Asp Asp Arg Gly Leu Ala Leu Asp Asn Ala Leu  
1490 1495 1500

Ser Gly Val Leu Ser Ala Ala Ile Lys Asp Cys Val Asp Ile Asn Lys  
1505 1510 1515 1520

Ala Ile Pro Ser Gly Asn Leu Ile Lys Phe Asp Ile Gly Ser Val Val  
1525 1530 1535

Val Tyr Met Cys Val Val Pro Ser Glu Lys Asp Lys His Leu Asp Asn  
1540 1545 1550

Asn Val Gln Arg Cys Thr Arg Lys Leu Asn Arg Leu Met Cys Asp Ile  
1555 1560 1565

Val Cys Thr Ile Pro Ala Asp Tyr Ile Leu Pro Leu Val Leu Ser Ser  
1570 1575 1580

Leu Thr Cys Asn Val Ser Phe Val Gly Glu Leu Lys Ala Ala Glu Ala  
1585 1590 1595 1600

Lys Val Ile Thr Ile Lys Val Thr Glu Asp Gly Val Asn Val His Asp  
1605 1610 1615

Val Thr Val Thr Thr Asp Lys Ser Phe Glu Gln Gln Val Gly Val Ile  
1620 1625 1630

Ala Asp Lys Asp Lys Asp Leu Ser Gly Ala Val Pro Ser Asp Leu Asn  
1635 1640 1645

Thr Ser Glu Leu Leu Thr Lys Ala Ile Asp Val Asp Trp Val Glu Phe  
1650 1655 1660

Tyr Gly Phe Lys Asp Ala Val Thr Phe Ala Thr Val Asp His Ser Ala  
1665 1670 1675 1680

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Phe Ala Tyr Glu Ser Ala Val Val Asn Gly Ile Arg Val Leu Lys Thr  
 1685 1690 1695  
 Ser Asp Asn Asn Cys Trp Val Asn Ala Val Cys Ile Ala Leu Gln Tyr  
 1700 1705 1710  
 Ser Lys Pro His Phe Ile Ser Gln Gly Leu Asp Ala Ala Trp Asn Lys  
 1715 1720 1725  
 Phe Val Leu Gly Asp Val Glu Ile Phe Val Ala Phe Val Tyr Tyr Val  
 1730 1735 1740  
 Ala Arg Leu Met Lys Gly Asp Lys Gly Asp Ala Glu Asp Thr Leu Thr  
 1745 1750 1755 1760  
 Lys Leu Ser Lys Tyr Leu Ala Asn Glu Ala Gln Val Gln Leu Glu His  
 1765 1770 1775  
 Tyr Ser Ser Cys Val Glu Cys Asp Ala Lys Phe Lys Asn Ser Val Ala  
 1780 1785 1790  
 Ser Ile Asn Ser Ala Ile Val Cys Ala Ser Val Lys Arg Asp Gly Val  
 1795 1800 1805  
 Gln Val Gly Tyr Cys Val His Gly Ile Lys Tyr Tyr Ser Arg Val Arg  
 1810 1815 1820  
 Ser Val Arg Gly Arg Ala Ile Ile Val Ser Val Glu Gln Leu Glu Pro  
 1825 1830 1835 1840  
 Cys Ala Gln Ser Arg Leu Leu Ser Gly Val Ala Tyr Thr Ala Phe Ser  
 1845 1850 1855  
 Gly Pro Val Asp Lys Gly His Tyr Thr Val Tyr Asp Thr Ala Lys Lys  
 1860 1865 1870  
 Ser Met Tyr Asp Gly Asp Arg Phe Val Lys His Asp Leu Ser Leu Leu  
 1875 1880 1885  
 Ser Val Thr Ser Val Val Met Val Gly Gly Tyr Val Ala Pro Val Asn  
 1890 1895 1900  
 Thr Val Lys Pro Lys Pro Val Ile Asn Gln Leu Asp Glu Lys Ala Gln  
 1905 1910 1915 1920  
 Lys Phe Phe Asp Phe Gly Asp Phe Leu Ile His Asn Phe Val Ile Phe  
 1925 1930 1935  
 Phe Thr Trp Leu Leu Ser Met Phe Thr Leu Cys Lys Thr Ala Val Thr  
 1940 1945 1950  
 Thr Gly Asp Val Lys Ile Met Ala Lys Ala Pro Gln Arg Thr Gly Val  
 1955 1960 1965  
 Val Leu Lys Arg Ser Leu Lys Tyr Asn Leu Lys Ala Ser Ala Ala Val  
 1970 1975 1980  
 Leu Lys Ser Lys Trp Trp Leu Leu Ala Lys Phe Thr Lys Leu Leu Leu  
 1985 1990 1995 2000  
 Leu Ile Tyr Thr Leu Tyr Ser Val Val Leu Leu Cys Val Arg Phe Gly  
 2005 2010 2015



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Pro Phe Asn Phe Cys Ser Glu Thr Val Asn Gly Tyr Ala Lys Ser Asn  
2020 2025 2030  
Phe Val Lys Asp Asp Tyr Cys Asp Gly Ser Leu Gly Cys Lys Met Cys  
2035 2040 2045  
Leu Phe Gly Tyr Gln Glu Leu Ser Gln Phe Ser His Leu Asp Val Val  
2050 2055 2060  
Trp Lys His Ile Thr Asp Pro Leu Phe Ser Asn Met Gln Pro Phe Ile  
2065 2070 2075 2080  
Val Met Val Leu Leu Leu Ile Phe Gly Asp Asn Tyr Leu Arg Cys Phe  
2085 2090 2095  
Leu Leu Tyr Phe Val Ala Gln Met Ile Ser Thr Val Gly Val Phe Leu  
2100 2105 2110  
Gly Tyr Lys Glu Thr Asn Trp Phe Leu His Phe Ile Pro Phe Asp Val  
2115 2120 2125  
Ile Cys Asp Glu Leu Leu Val Thr Val Ile Val Ile Lys Val Ile Ser  
2130 2135 2140  
Phe Val Arg His Val Leu Phe Gly Cys Glu Asn Pro Asp Cys Ile Ala  
2145 2150 2155 2160  
Cys Ser Lys Ser Ala Arg Leu Lys Arg Phe Pro Val Asn Thr Ile Val  
2165 2170 2175  
Asn Gly Val Gln Arg Ser Phe Tyr Val Asn Ala Asn Gly Gly Ser Lys  
2180 2185 2190  
Phe Cys Lys Lys His Arg Phe Phe Cys Val Asp Cys Asp Ser Tyr Gly  
2195 2200 2205  
Tyr Gly Ser Thr Phe Ile Thr Pro Glu Val Ser Arg Glu Leu Gly Asn  
2210 2215 2220  
Ile Thr Lys Thr Asn Val Gln Pro Thr Gly Pro Ala Tyr Val Met Ile  
2225 2230 2235 2240  
Asp Lys Val Glu Phe Glu Asn Gly Phe Tyr Arg Leu Tyr Ser Cys Glu  
2245 2250 2255  
Thr Phe Trp Arg Tyr Asn Phe Asp Ile Thr Glu Ser Lys Tyr Ser Cys  
2260 2265 2270  
Lys Glu Val Phe Lys Asn Cys Asn Val Leu Asp Asp Phe Ile Val Phe  
2275 2280 2285  
Asn Asn Asn Gly Thr Asn Val Thr Gln Val Lys Asn Ala Ser Val Tyr  
2290 2295 2300  
Phe Ser Gln Leu Leu Cys Arg Pro Ile Lys Leu Val Asp Ser Glu Leu  
2305 2310 2315 2320  
Leu Ser Thr Leu Ser Val Asp Phe Asn Gly Val Leu His Lys Ala Tyr  
2325 2330 2335  
Ile Asp Val Leu Arg Asn Ser Phe Gly Lys Asp Leu Asn Ala Asn Met  
2340 2345 2350

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Ser Leu Ala Glu Cys Lys Arg Ala Leu Gly Leu Ser Ile Ser Asp His  
2355 2360 2365

Glu Phe Thr Ser Ala Ile Ser Asn Ala His Arg Cys Asp Val Leu Leu  
2370 2375 2380

Ser Asp Leu Ser Phe Asn Asn Phe Val Ser Ser Tyr Ala Lys Pro Glu  
2385 2390 2395 2400

Glu Lys Leu Ser Ala Tyr Asp Leu Ala Cys Cys Met Arg Ala Gly Ala  
2405 2410 2415

Lys Val Val Asn Ala Asn Val Leu Thr Lys Asp Gln Thr Pro Ile Val  
2420 2425 2430

Trp His Ala Lys Asp Phe Asn Ser Leu Ser Ala Glu Gly Arg Lys Tyr  
2435 2440 2445

Ile Val Lys Thr Ser Lys Ala Lys Gly Leu Thr Phe Leu Leu Thr Ile  
2450 2455 2460

Asn Glu Asn Gln Ala Val Thr Gln Ile Pro Ala Thr Ser Ile Val Ala  
2465 2470 2475 2480

Lys Gln Gly Ala Gly Asp Ala Gly His Ser Leu Thr Trp Leu Trp Leu  
2485 2490 2495

Leu Cys Gly Leu Val Cys Leu Ile Gln Phe Tyr Leu Cys Phe Phe Met  
2500 2505 2510

Pro Tyr Phe Met Tyr Asp Ile Val Ser Ser Phe Glu Gly Tyr Asp Phe  
2515 2520 2525

Lys Tyr Ile Glu Asn Gly Gln Leu Lys Asn Phe Glu Ala Pro Leu Lys  
2530 2535 2540

Cys Val Arg Asn Val Phe Glu Asn Phe Glu Asp Trp His Tyr Ala Lys  
2545 2550 2555 2560

Phe Gly Phe Thr Pro Leu Asn Lys Gln Ser Cys Pro Ile Val Val Gly  
2565 2570 2575

Val Ser Glu Ile Val Asn Thr Val Ala Gly Ile Pro Ser Asn Val Tyr  
2580 2585 2590

Leu Val Gly Lys Thr Leu Ile Phe Thr Leu Gln Ala Ala Phe Gly Asn  
2595 2600 2605

Ala Gly Val Cys Tyr Asp Ile Phe Gly Val Thr Thr Pro Glu Lys Cys  
2610 2615 2620

Ile Phe Thr Ser Ala Cys Thr Arg Leu Glu Gly Leu Gly Gly Asn Asn  
2625 2630 2635 2640

Val Tyr Cys Tyr Asn Thr Ala Leu Met Glu Gly Ser Leu Pro Tyr Ser  
2645 2650 2655

Ser Ile Gln Ala Asn Ala Tyr Tyr Lys Tyr Asp Asn Gly Asn Phe Ile  
2660 2665 2670

Lys Leu Pro Glu Val Ile Ala Gln Gly Phe Gly Phe Arg Thr Val Arg  
2675 2680 2685

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Thr Ile Ala Thr Lys Tyr Cys Arg Val Gly Glu Cys Val Glu Ser Asn  
 2690 2695 2700  
 Ala Gly Val Cys Phe Gly Phe Asp Lys Trp Phe Val Asn Asp Gly Arg  
 2705 2710 2715 2720  
 Val Ala Asn Gly Tyr Val Cys Gly Thr Gly Leu Trp Asn Leu Val Phe  
 2725 2730 2735  
 Asn Ile Leu Ser Met Phe Ser Ser Ser Phe Ser Val Ala Ala Met Ser  
 2740 2745 2750  
 Gly Gln Ile Leu Leu Asn Cys Ala Leu Gly Ala Phe Ala Ile Phe Cys  
 2755 2760 2765  
 Cys Phe Leu Val Thr Lys Phe Arg Arg Met Phe Gly Asp Leu Ser Val  
 2770 2775 2780  
 Gly Val Cys Thr Val Val Val Ala Val Leu Leu Asn Asn Val Ser Tyr  
 2785 2790 2795 2800  
 Ile Val Thr Gln Asn Leu Val Thr Met Ile Ala Tyr Ala Ile Leu Tyr  
 2805 2810 2815  
 Phe Phe Ala Thr Arg Ser Leu Arg Tyr Ala Trp Ile Trp Cys Ala Ala  
 2820 2825 2830  
 Tyr Leu Ile Ala Tyr Ile Ser Phe Ala Pro Trp Trp Leu Cys Ala Trp  
 2835 2840 2845  
 Tyr Phe Leu Ala Met Leu Thr Gly Leu Leu Pro Ser Leu Leu Lys Leu  
 2850 2855 2860  
 Lys Val Ser Thr Asn Leu Phe Gly Gly Asp Lys Phe Val Gly Thr Phe  
 2865 2870 2875 2880  
 Glu Ser Ala Ala Ala Gly Thr Phe Val Ile Asp Met Arg Ser Tyr Glu  
 2885 2890 2895  
 Lys Leu Ala Asn Ser Ile Ser Pro Glu Lys Leu Lys Ser Tyr Ala Ala  
 2900 2905 2910  
 Ser Tyr Asn Arg Tyr Lys Tyr Tyr Ser Gly Asn Ala Asn Glu Ala Asp  
 2915 2920 2925  
 Tyr Arg Cys Ala Cys Tyr Ala Tyr Leu Ala Lys Ala Met Leu Asp Phe  
 2930 2935 2940  
 Ser Arg Asp His Asn Asp Ile Leu Tyr Thr Pro Pro Thr Val Ser Tyr  
 2945 2950 2955 2960  
 Gly Ser Thr Leu Gln Ala Gly Leu Arg Lys Met Ala Gln Pro Ser Gly  
 2965 2970 2975  
 Phe Val Glu Lys Cys Val Val Arg Val Cys Tyr Gly Asn Thr Val Leu  
 2980 2985 2990  
 Asn Gly Leu Trp Leu Gly Asp Ile Val Tyr Cys Pro Arg His Val Ile  
 2995 3000 3005  
 Ala Ser Asn Thr Thr Ser Ala Ile Asp Tyr Asp His Glu Tyr Ser Ile  
 3010 3015 3020

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Met Arg Leu His Asn Phe Ser Ile Ile Ser Gly Thr Ala Phe Leu Gly  
3025 3030 3035 3040  
Val Val Gly Ala Thr Met His Gly Val Thr Leu Lys Ile Lys Val Ser  
3045 3050 3055  
Gln Thr Asn Met His Thr Pro Arg His Ser Phe Arg Thr Leu Lys Ser  
3060 3065 3070  
Gly Glu Gly Phe Asn Ile Leu Ala Cys Tyr Asp Gly Cys Ala Gln Gly  
3075 3080 3085  
Val Phe Gly Val Asn Met Arg Thr Asn Trp Thr Ile Arg Gly Ser Phe  
3090 3095 3100  
Ile Asn Gly Ala Cys Gly Ser Pro Gly Tyr Asn Leu Lys Asn Gly Glu  
3105 3110 3115 3120  
Val Glu Phe Val Tyr Met His Gln Ile Glu Leu Gly Ser Gly Ser His  
3125 3130 3135  
Val Gly Ser Ser Phe Asp Gly Val Met Tyr Gly Gly Phe Glu Asp Gln  
3140 3145 3150  
Pro Asn Leu Gln Val Glu Ser Ala Asn Gln Met Leu Thr Val Asn Val  
3155 3160 3165  
Val Ala Phe Leu Tyr Ala Ala Ile Leu Asn Gly Cys Thr Trp Trp Leu  
3170 3175 3180  
Lys Gly Glu Lys Leu Phe Val Glu His Tyr Asn Glu Trp Ala Gln Ala  
3185 3190 3195 3200  
Asn Gly Phe Thr Ala Met Asn Gly Glu Asp Ala Phe Ser Ile Leu Ala  
3205 3210 3215  
Ala Lys Thr Gly Val Cys Val Glu Arg Leu Leu His Ala Ile Gln Val  
3220 3225 3230  
Leu Asn Asn Gly Phe Gly Gly Lys Gln Ile Leu Gly Tyr Ser Ser Leu  
3235 3240 3245  
Asn Asp Glu Phe Ser Ile Asn Glu Val Val Lys Gln Met Phe Gly Val  
3250 3255 3260  
Asn Leu Gln Ser Gly Lys Thr Thr Ser Met Phe Lys Ser Ile Ser Leu  
3265 3270 3275 3280  
Phe Ala Gly Phe Phe Val Met Phe Trp Ala Glu Leu Phe Val Tyr Thr  
3285 3290 3295  
Thr Thr Ile Trp Val Asn Pro Gly Phe Leu Thr Pro Phe Met Ile Leu  
3300 3305 3310  
Leu Val Ala Leu Ser Leu Cys Leu Thr Phe Val Val Lys His Lys Val  
3315 3320 3325  
Leu Phe Leu Gln Val Phe Leu Leu Pro Ser Ile Ile Val Ala Ala Ile  
3330 3335 3340  
Gln Asn Cys Ala Trp Asp Tyr His Val Thr Lys Val Leu Ala Glu Lys  
3345 3350 3355 3360

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Phe Asp Tyr Asn Val Ser Val Met Gln Met Asp Ile Gln Gly Phe Val  
 3365 3370 3375  
 Asn Ile Phe Ile Cys Leu Phe Val Ala Leu Leu His Thr Trp Arg Phe  
 3380 3385 3390  
 Ala Lys Glu Arg Cys Thr His Trp Cys Thr Tyr Leu Phe Ser Leu Ile  
 3395 3400 3405  
 Ala Val Leu Tyr Thr Ala Leu Tyr Ser Tyr Asp Tyr Val Ser Leu Leu  
 3410 3415 3420  
 Val Met Leu Leu Cys Ala Ile Ser Asn Glu Trp Tyr Ile Gly Ala Ile  
 3425 3430 3435 3440  
 Ile Phe Arg Ile Cys Arg Phe Gly Val Ala Phe Leu Pro Val Glu Tyr  
 3445 3450 3455  
 Val Ser Tyr Phe Asp Gly Val Lys Thr Val Leu Leu Phe Tyr Met Leu  
 3460 3465 3470  
 Leu Gly Phe Val Ser Cys Met Tyr Tyr Gly Leu Leu Tyr Trp Ile Asn  
 3475 3480 3485  
 Arg Phe Cys Lys Cys Thr Leu Gly Val Tyr Asp Phe Cys Val Ser Pro  
 3490 3495 3500  
 Ala Glu Phe Lys Tyr Met Val Ala Asn Gly Leu Asn Ala Pro Asn Gly  
 3505 3510 3515 3520  
 Pro Phe Asp Ala Leu Phe Leu Ser Phe Lys Leu Met Gly Ile Gly Gly  
 3525 3530 3535  
 Pro Arg Thr Ile Lys Val Ser Thr Val Gln Ser Lys Leu Thr Asp Leu  
 3540 3545 3550  
 Lys Cys Thr Asn Val Val Leu Met Gly Ile Leu Ser Asn Met Asn Ile  
 3555 3560 3565  
 Ala Ser Asn Ser Lys Glu Trp Ala Tyr Cys Val Glu Met His Asn Lys  
 3570 3575 3580  
 Ile Asn Leu Cys Asp Asp Pro Glu Thr Ala Gln Glu Leu Leu Leu Ala  
 3585 3590 3595 3600  
 Leu Leu Ala Phe Phe Leu Ser Lys His Ser Asp Phe Gly Leu Gly Asp  
 3605 3610 3615  
 Leu Val Asp Ser Tyr Phe Glu Asn Asp Ser Ile Leu Gln Ser Val Ala  
 3620 3625 3630  
 Ser Ser Phe Val Gly Met Pro Ser Phe Val Ala Tyr Glu Thr Ala Arg  
 3635 3640 3645  
 Gln Glu Tyr Glu Asn Ala Val Ala Asn Gly Ser Ser Pro Gln Ile Ile  
 3650 3655 3660  
 Lys Gln Leu Lys Lys Ala Met Asn Val Ala Lys Ala Glu Phe Asp Arg  
 3665 3670 3675 3680  
 Glu Ser Ser Val Gln Lys Lys Ile Asn Arg Met Ala Glu Gln Ala Ala  
 3685 3690 3695

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Ala Ala Met Tyr Lys Glu Ala Arg Ala Val Asn Arg Lys Ser Lys Val  
3700 3705 3710

Val Ser Ala Met His Ser Leu Leu Phe Gly Met Leu Arg Arg Leu Asp  
3715 3720 3725

Met Ser Ser Val Asp Thr Ile Leu Asn Met Ala Arg Asn Gly Val Val  
3730 3735 3740

Pro Leu Ser Val Ile Pro Ala Thr Ser Ala Ala Arg Leu Val Val Val  
3745 3750 3755 3760

Val Pro Asp His Asp Ser Phe Val Lys Met Met Val Asp Gly Phe Val  
3765 3770 3775

His Tyr Ala Gly Val Val Trp Thr Leu Gln Glu Val Lys Asp Asn Asp  
3780 3785 3790

Gly Lys Asn Val His Leu Lys Asp Val Thr Lys Glu Asn Gln Glu Ile  
3795 3800 3805

Leu Val Trp Pro Leu Ile Leu Thr Cys Glu Arg Val Val Lys Leu Gln  
3810 3815 3820

Asn Asn Glu Ile Met Pro Gly Lys Met Lys Val Lys Ala Thr Lys Gly  
3825 3830 3835 3840

Glu Gly Asp Gly Gly Ile Thr Ser Glu Gly Asn Ala Leu Tyr Asn Asn  
3845 3850 3855

Glu Gly Gly Arg Ala Phe Met Tyr Ala Tyr Val Thr Thr Lys Pro Gly  
3860 3865 3870

Met Lys Tyr Val Lys Trp Glu His Asp Ser Gly Val Val Thr Val Glu  
3875 3880 3885

Leu Glu Pro Pro Cys Arg Phe Val Ile Asp Thr Pro Thr Gly Pro Gln  
3890 3895 3900

Ile Lys Tyr Leu Tyr Phe Val Lys Asn Leu Asn Asn Leu Arg Arg Gly  
3905 3910 3915 3920

Ala Val Leu Gly Tyr Ile Gly Ala Thr Val Arg Leu Gln Ala Gly Lys  
3925 3930 3935

Gln Thr Glu Phe Val Ser Asn Ser His Leu Leu Thr His Cys Ser Phe  
3940 3945 3950

Ala Val Asp Pro Ala Ala Ala Tyr Leu Asp Ala Val Lys Gln Gly Ala  
3955 3960 3965

Lys Pro Val Gly Asn Cys Val Lys Met Leu Thr Asn Gly Ser Gly Ser  
3970 3975 3980

Gly Gln Ala Ile Thr Cys Thr Ile Asp Ser Asn Thr Thr Gln Asp Thr  
3985 3990 3995 4000

Tyr Gly Gly Ala Ser Val Cys Ile Tyr Cys Arg Ala His Val Ala His  
4005 4010 4015

Pro Thr Met Asp Gly Phe Cys Gln Tyr Lys Gly Lys Trp Val Gln Val  
4020 4025 4030

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Pro Ile Gly Thr Asn Asp Pro Ile Arg Phe Cys Leu Glu Asn Thr Val  
4035 4040 4045

Cys Lys Val Cys Gly Cys Trp Leu Asn His Gly Cys Thr Cys Asp Arg  
4050 4055 4060

Thr Ala Ile Gln Ser Phe Asp Asn Ser Tyr Leu Asn Arg Val Arg Gly  
4065 4070 4075 4080

Ser Ser Ala Ala Arg Leu Glu Pro Cys Asn Gly Thr Asp Ile Asp Tyr  
4085 4090 4095

Cys Val Arg Ala Phe Asp Val Tyr Asn Lys Asp Ala Ser Phe Ile Gly  
4100 4105 4110

Lys Asn Leu Lys Ser Asn Cys Val Arg Phe Lys Asn Val Asp Lys Asp  
4115 4120 4125

Asp Ala Phe Tyr Ile Val Lys Arg Cys Ile Lys Ser Val Met Asp His  
4130 4135 4140

Glu Gln Ser Met Tyr Asn Leu Leu Lys Gly Cys Asn Ala Val Ala Lys  
4145 4150 4155 4160

His Asp Phe Phe Thr Trp His Glu Gly Arg Thr Ile Tyr Gly Asn Val  
4165 4170 4175

Ser Arg Gln Asp Leu Thr Lys Tyr Thr Met Met Asp Leu Cys Phe Ala  
4180 4185 4190

Leu Arg Asn Phe Asp Glu Lys Asp Cys Glu Val Phe Lys Glu Ile Leu  
4195 4200 4205

Val Leu Thr Gly Cys Cys Ser Thr Asp Tyr Phe Glu Met Lys Asn Trp  
4210 4215 4220

Phe Asp Pro Ile Glu Asn Glu Asp Ile His Arg Val Tyr Ala Ala Leu  
4225 4230 4235 4240

Gly Lys Val Val Ala Asn Ala Met Leu Lys Cys Val Ala Phe Cys Asp  
4245 4250 4255

Glu Met Val Leu Lys Gly Val Val Gly Val Leu Thr Leu Asp Asn Gln  
4260 4265 4270

Asp Leu Asn Gly Asn Phe Tyr Asp Phe Gly Asp Phe Val Leu Cys Pro  
4275 4280 4285

Pro Gly Met Gly Ile Pro Tyr Cys Thr Ser Tyr Tyr Ser Tyr Met Met  
4290 4295 4300

Pro Val Met Gly Met Thr Asn Cys Leu Ala Ser Glu Cys Phe Met Lys  
4305 4310 4315 4320

Ser Asp Ile Phe Gly Gln Asp Phe Lys Thr Phe Asp Leu Leu Lys Tyr  
4325 4330 4335

Asp Phe Thr Glu His Lys Glu Val Leu Phe Asn Lys Tyr Phe Lys Tyr  
4340 4345 4350

Trp Gly Gln Asp Tyr His Pro Asp Cys Val Asp Cys His Asp Glu Met  
4355 4360 4365

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Cys Ile Leu His Cys Ser Asn Phe Asn Thr Leu Phe Ala Thr Thr Ile  
 4370 4375 4380  
 Pro Asn Thr Ala Phe Gly Pro Leu Cys Arg Lys Val Phe Ile Asp Gly  
 4385 4390 4395 4400  
 Val Pro Val Val Ala Thr Ala Gly Tyr His Phe Lys Gln Leu Gly Leu  
 4405 4410 4415  
 Val Trp Asn Lys Asp Val Asn Thr His Ser Thr Arg Leu Thr Ile Thr  
 4420 4425 4430  
 Glu Leu Leu Gln Phe Val Thr Asp Pro Thr Leu Ile Val Ala Ser Ser  
 4435 4440 4445  
 Pro Ala Leu Val Asp Lys Arg Thr Val Cys Phe Ser Val Ala Ala Leu  
 4450 4455 4460  
 Ser Thr Gly Leu Thr Ser Gln Thr Val Lys Pro Gly His Phe Asn Lys  
 4465 4470 4475 4480  
 Glu Phe Tyr Asp Phe Leu Arg Ser Gln Gly Phe Phe Asp Glu Gly Ser  
 4485 4490 4495  
 Glu Leu Thr Leu Lys His Phe Phe Phe Thr Gln Lys Gly Asp Ala Ala  
 4500 4505 4510  
 Ile Lys Asp Phe Asp Tyr Tyr Arg Tyr Asn Arg Pro Thr Met Leu Asp  
 4515 4520 4525  
 Ile Gly Gln Ala Arg Val Ala Tyr Gln Val Ala Ala Arg Tyr Phe Asp  
 4530 4535 4540  
 Cys Tyr Glu Gly Gly Cys Ile Thr Ser Arg Glu Val Val Val Thr Asn  
 4545 4550 4555 4560  
 Leu Asn Lys Ser Ala Gly Trp Pro Leu Asn Lys Phe Gly Lys Ala Gly  
 4565 4570 4575  
 Leu Tyr Tyr Glu Ser Ile Ser Tyr Glu Glu Gln Asp Ala Ile Phe Ser  
 4580 4585 4590  
 Leu Thr Lys Arg Asn Ile Leu Pro Thr Met Thr Gln Leu Asn Leu Lys  
 4595 4600 4605  
 Tyr Ala Ile Ser Gly Lys Glu Arg Ala Arg Thr Val Gly Gly Val Ser  
 4610 4615 4620  
 Leu Leu Ala Thr Met Thr Thr Arg Gln Phe His Gln Lys Cys Leu Lys  
 4625 4630 4635 4640  
 Ser Ile Val Ala Thr Arg Asn Ala Thr Val Val Ile Gly Thr Thr Lys  
 4645 4650 4655  
 Phe Tyr Gly Gly Trp Asp Asn Met Leu Lys Asn Leu Met Ala Asp Val  
 4660 4665 4670  
 Asp Asp Pro Lys Leu Met Gly Trp Asp Tyr Pro Lys Cys Asp Arg Ala  
 4675 4680 4685  
 Met Pro Ser Met Ile Arg Met Leu Ser Ala Met Ile Leu Gly Ser Lys  
 4690 4695 4700



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His Val Thr Cys Cys Thr Ala Ser Asp Lys Phe Tyr Arg Leu Ser Asn  
 4705 4710 4715 4720  
 Glu Leu Ala Gln Val Leu Thr Glu Val Val Tyr Ser Asn Gly Gly Phe  
 4725 4730 4735  
 Tyr Phe Lys Pro Gly Gly Thr Thr Ser Gly Asp Ala Thr Thr Ala Tyr  
 4740 4745 4750  
 Ala Asn Ser Val Phe Asn Ile Phe Gln Ala Val Ser Ser Asn Ile Asn  
 4755 4760 4765  
 Cys Val Leu Ser Val Asn Ser Ser Asn Cys Asn Asn Phe Asn Val Lys  
 4770 4775 4780  
 Lys Leu Gln Arg Gln Leu Tyr Asp Asn Cys Tyr Arg Asn Ser Asn Val  
 4785 4790 4795 4800  
 Asp Glu Ser Phe Val Asp Asp Phe Tyr Gly Tyr Leu Gln Lys His Phe  
 4805 4810 4815  
 Ser Met Met Ile Leu Ser Asp Asp Ser Val Val Cys Tyr Asn Lys Thr  
 4820 4825 4830  
 Tyr Ala Gly Leu Gly Tyr Ile Ala Asp Ile Ser Ala Phe Lys Ala Thr  
 4835 4840 4845  
 Leu Tyr Tyr Gln Asn Gly Val Phe Met Ser Thr Ala Lys Cys Trp Thr  
 4850 4855 4860  
 Glu Glu Asp Leu Ser Ile Gly Pro His Glu Phe Cys Ser Gln His Thr  
 4865 4870 4875 4880  
 Met Gln Ile Val Asp Glu Asn Gly Lys Tyr Tyr Leu Pro Tyr Pro Asp  
 4885 4890 4895  
 Pro Ser Arg Ile Ile Ser Ala Gly Val Phe Val Asp Asp Ile Thr Lys  
 4900 4905 4910  
 Thr Asp Ala Val Ile Leu Leu Glu Arg Tyr Val Ser Leu Ala Ile Asp  
 4915 4920 4925  
 Ala Tyr Pro Leu Ser Lys His Pro Lys Pro Glu Tyr Arg Lys Val Phe  
 4930 4935 4940  
 Tyr Ala Leu Leu Asp Trp Val Lys His Leu Asn Lys Thr Leu Asn Glu  
 4945 4950 4955 4960  
 Gly Val Leu Glu Ser Phe Ser Val Thr Leu Leu Asp Glu His Glu Ser  
 4965 4970 4975  
 Lys Phe Trp Asp Glu Ser Phe Tyr Ala Ser Met Tyr Glu Lys Ser Thr  
 4980 4985 4990  
 Val Leu Gln Ala Ala Gly Leu Cys Val Val Cys Gly Ser Gln Thr Val  
 4995 5000 5005  
 Leu Arg Cys Gly Asp Cys Leu Arg Arg Pro Met Leu Cys Thr Lys Cys  
 5010 5015 5020  
 Ala Tyr Asp His Val Phe Gly Thr Asp His Lys Phe Ile Leu Ala Ile  
 5025 5030 5035 5040

SEQLIST-20480.TXT

Thr Pro Tyr Val Cys Asn Thr Ser Gly Cys Asn Val Asn Asp Val Thr  
 5045 5050 5055  
 Lys Leu Tyr Leu Gly Gly Leu Asn Tyr Tyr Cys Val Asp His Lys Pro  
 5060 5065 5070  
 His Leu Ser Phe Pro Leu Cys Ser Ala Gly Asn Val Phe Gly Leu Tyr  
 5075 5080 5085  
 Lys Ser Ser Ala Leu Gly Ser Met Asp Ile Asp Val Phe Asn Lys Leu  
 5090 5095 5100  
 Ser Thr Ser Asp Trp Ser Asp Ile Arg Asp Tyr Lys Leu Ala Asn Asp  
 5105 5110 5115 5120  
 Ala Lys Glu Ser Leu Arg Leu Phe Ala Ala Glu Thr Val Lys Ala Lys  
 5125 5130 5135  
 Glu Glu Ser Val Lys Ser Ser Tyr Ala Tyr Ala Thr Leu Lys Glu Ile  
 5140 5145 5150  
 Val Gly Pro Lys Glu Leu Leu Leu Leu Trp Glu Ser Gly Lys Ala Lys  
 5155 5160 5165  
 Pro Pro Leu Asn Arg Asn Ser Val Phe Thr Cys Phe Gln Ile Thr Lys  
 5170 5175 5180  
 Asp Ser Lys Phe Gln Val Gly Glu Phe Val Phe Glu Lys Val Asp Tyr  
 5185 5190 5195 5200  
 Gly Ser Asp Thr Val Thr Tyr Lys Ser Thr Ala Thr Thr Lys Leu Val  
 5205 5210 5215  
 Pro Gly Met Leu Phe Ile Leu Thr Ser His Asn Val Ala Pro Leu Arg  
 5220 5225 5230  
 Ala Pro Thr Met Ala Asn Gln Glu Lys Tyr Ser Thr Ile Tyr Lys Leu  
 5235 5240 5245  
 His Pro Ser Phe Asn Val Ser Asp Ala Tyr Ala Asn Leu Val Pro Tyr  
 5250 5255 5260  
 Tyr Gln Leu Ile Gly Lys Gln Arg Ile Thr Thr Ile Gln Gly Pro Pro  
 5265 5270 5275 5280  
 Gly Ser Gly Lys Ser His Cys Ser Ile Gly Ile Gly Val Tyr Tyr Pro  
 5285 5290 5295  
 Gly Ala Arg Ile Val Phe Thr Ala Cys Ser His Ala Ala Val Asp Ser  
 5300 5305 5310  
 Leu Cys Ala Lys Ala Val Thr Ala Tyr Ser Val Asp Lys Cys Thr Arg  
 5315 5320 5325  
 Ile Ile Pro Ala Arg Ala Arg Val Glu Cys Tyr Ser Gly Phe Lys Pro  
 5330 5335 5340  
 Asn Asn Asn Ser Ala Gln Tyr Val Phe Ser Thr Val Asn Ala Leu Pro  
 5345 5350 5355 5360  
 Glu Val Asn Ala Asp Ile Val Val Val Asp Glu Val Ser Met Cys Thr  
 5365 5370 5375

SEQLIST-20480.TXT

Asn Tyr Asp Leu Ser Val Ile Asn Gln Arg Ile Ser Tyr Lys His Ile  
 5380 5385 5390  
 Val Tyr Val Gly Asp Pro Gln Gln Leu Pro Ala Pro Arg Val Leu Ile  
 5395 5400 5405  
 Ser Lys Gly Val Met Glu Pro Ile Asp Tyr Asn Val Val Thr Gln Arg  
 5410 5415 5420  
 Met Cys Ala Ile Gly Pro Asp Val Phe Leu His Lys Cys Tyr Arg Cys  
 5425 5430 5435 5440  
 Pro Ala Glu Ile Val Asn Thr Val Ser Glu Leu Val Tyr Glu Asn Lys  
 5445 5450 5455  
 Phe Val Pro Val Lys Glu Ala Ser Lys Gln Cys Phe Lys Ile Phe Glu  
 5460 5465 5470  
 Arg Gly Ser Val Gln Val Asp Asn Gly Ser Ser Ile Asn Arg Arg Gln  
 5475 5480 5485  
 Leu Asp Val Val Lys Arg Phe Ile His Lys Asn Ser Thr Trp Ser Lys  
 5490 5495 5500  
 Ala Val Phe Ile Ser Pro Tyr Asn Ser Gln Asn Tyr Val Ala Ala Arg  
 5505 5510 5515 5520  
 Leu Leu Gly Leu Gln Thr Gln Thr Val Asp Ser Ala Gln Gly Ser Glu  
 5525 5530 5535  
 Tyr Asp Tyr Val Ile Phe Ala Gln Thr Ser Asp Thr Ala His Ala Cys  
 5540 5545 5550  
 Asn Ala Asn Arg Phe Asn Val Ala Ile Thr Arg Ala Lys Lys Gly Ile  
 5555 5560 5565  
 Phe Cys Ile Met Ser Asp Arg Thr Leu Phe Asp Ala Leu Lys Phe Phe  
 5570 5575 5580  
 Glu Ile Thr Met Thr Asp Leu Gln Ser Glu Ser Ser Cys Gly Leu Phe  
 5585 5590 5595 5600  
 Lys Asp Cys Ala Arg Asn Pro Ile Asp Leu Pro Pro Ser His Ala Thr  
 5605 5610 5615  
 Thr Tyr Leu Ser Leu Ser Asp Arg Phe Lys Thr Ser Gly Asp Leu Ala  
 5620 5625 5630  
 Val Gln Ile Gly Asn Asn Asn Val Cys Thr Tyr Glu His Val Ile Ser  
 5635 5640 5645  
 Tyr Met Gly Phe Arg Phe Asp Val Ser Met Pro Gly Ser His Ser Leu  
 5650 5655 5660  
 Phe Cys Thr Arg Asp Phe Ala Met Arg His Val Arg Gly Trp Leu Gly  
 5665 5670 5675 5680  
 Met Asp Val Glu Gly Ala His Val Thr Gly Asp Asn Val Gly Thr Asn  
 5685 5690 5695  
 Val Pro Leu Gln Val Gly Phe Ser Asn Gly Val Asp Phe Val Ala Gln  
 5700 5705 5710

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Pro Glu Gly Cys Val Leu Thr Asn Thr Gly Ser Val Val Lys Pro Val  
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Arg Ala Arg Ala Pro Pro Gly Glu Gln Phe Thr His Ile Val Pro Leu  
5730 5735 5740

Leu Arg Lys Gly Gln Pro Trp Ser Val Leu Arg Lys Arg Ile Val Gln  
5745 5750 5755 5760

Met Ile Ala Asp Phe Leu Ala Gly Ser Ser Asp Val Leu Val Phe Val  
5765 5770 5775

Leu Trp Ala Gly Gly Leu Glu Leu Thr Thr Met Arg Tyr Phe Val Lys  
5780 5785 5790

Ile Gly Ala Val Lys His Cys Gln Cys Gly Thr Val Ala Thr Cys Tyr  
5795 5800 5805

Asn Ser Val Ser Asn Asp Tyr Cys Cys Phe Lys His Ala Leu Gly Cys  
5810 5815 5820

Asp Tyr Val Tyr Asn Pro Tyr Val Ile Asp Ile Gln Gln Trp Gly Tyr  
5825 5830 5835 5840

Val Gly Ser Leu Ser Thr Asn His His Ala Ile Cys Asn Val His Arg  
5845 5850 5855

Asn Glu His Val Ala Ser Gly Asp Ala Ile Met Thr Arg Cys Leu Ala  
5860 5865 5870

Val Tyr Asp Cys Phe Val Lys Asn Val Asp Trp Ser Ile Thr Tyr Pro  
5875 5880 5885

Met Ile Ala Asn Glu Asn Ala Ile Asn Lys Gly Gly Arg Thr Val Gln  
5890 5895 5900

Ser His Ile Met Arg Ala Ala Ile Lys Leu Tyr Asn Pro Lys Ala Ile  
5905 5910 5915 5920

His Asp Ile Gly Asn Pro Lys Gly Ile Arg Cys Ala Val Thr Asp Ala  
5925 5930 5935

Lys Trp Tyr Cys Tyr Asp Lys Asn Pro Ile Asn Ser Asn Val Lys Thr  
5940 5945 5950

Leu Glu Tyr Asp Tyr Met Thr His Gly Gln Met Asp Gly Leu Cys Leu  
5955 5960 5965

Phe Trp Asn Cys Asn Val Asp Met Tyr Pro Glu Phe Ser Ile Val Cys  
5970 5975 5980

Arg Phe Asp Thr Arg Thr Arg Ser Thr Leu Asn Leu Glu Gly Val Asn  
5985 5990 5995 6000

Gly Gly Ser Leu Tyr Val Asn Asn His Ala Phe His Thr Pro Ala Tyr  
6005 6010 6015

Asp Lys Arg Ala Met Ala Lys Leu Lys Pro Ala Pro Phe Phe Tyr Tyr  
6020 6025 6030

Asp Asp Gly Ser Cys Glu Val Val His Asp Gln Val Asn Tyr Val Pro  
6035 6040 6045

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Leu Arg Ala Thr Asn Cys Ile Thr Lys Cys Asn Ile Gly Gly Ala Val  
 6050 6055 6060  
 Cys Ser Lys His Ala Asn Leu Tyr Arg Ala Tyr Val Glu Ser Tyr Asn  
 6065 6070 6075 6080  
 Ile Phe Thr Gln Ala Gly Phe Asn Ile Trp Val Pro Thr Thr Phe Asp  
 6085 6090 6095  
 Cys Tyr Asn Leu Trp Gln Thr Phe Thr Glu Val Asn Leu Gln Gly Leu  
 6100 6105 6110  
 Glu Asn Ile Ala Phe Asn Val Val Asn Lys Gly Ser Phe Val Gly Ala  
 6115 6120 6125  
 Asp Gly Glu Leu Pro Val Ala Ile Ser Gly Asp Lys Val Phe Val Arg  
 6130 6135 6140  
 Asp Gly Asn Thr Asp Asn Leu Val Phe Val Asn Lys Thr Ser Leu Pro  
 6145 6150 6155 6160  
 Thr Asn Ile Ala Phe Glu Leu Phe Ala Lys Arg Lys Val Gly Leu Thr  
 6165 6170 6175  
 Pro Pro Leu Ser Ile Leu Lys Asn Leu Gly Val Val Ala Thr Tyr Lys  
 6180 6185 6190  
 Phe Val Leu Trp Asp Tyr Glu Ala Glu Arg Pro Leu Thr Ser Phe Thr  
 6195 6200 6205  
 Lys Ser Val Cys Gly Tyr Thr Asp Phe Ala Glu Asp Val Cys Thr Cys  
 6210 6215 6220  
 Tyr Asp Asn Ser Ile Gln Gly Ser Tyr Glu Arg Phe Thr Leu Ser Thr  
 6225 6230 6235 6240  
 Asn Ala Val Leu Phe Ser Ala Thr Ala Val Lys Thr Gly Gly Lys Ser  
 6245 6250 6255  
 Leu Pro Ala Ile Lys Leu Asn Phe Gly Met Leu Asn Gly Asn Ala Ile  
 6260 6265 6270  
 Ala Thr Val Lys Ser Glu Asp Gly Asn Ile Lys Asn Ile Asn Trp Phe  
 6275 6280 6285  
 Val Tyr Val Arg Lys Asp Gly Lys Pro Val Asp His Tyr Asp Gly Phe  
 6290 6295 6300  
 Tyr Thr Gln Gly Arg Asn Leu Gln Asp Phe Leu Pro Arg Ser Thr Met  
 6305 6310 6315 6320  
 Glu Glu Asp Phe Leu Asn Met Asp Ile Gly Val Phe Ile Gln Lys Tyr  
 6325 6330 6335  
 Gly Leu Glu Asp Phe Asn Phe Glu His Val Val Tyr Gly Asp Val Ser  
 6340 6345 6350  
 Lys Thr Thr Leu Gly Gly Leu His Leu Leu Ile Ser Gln Val Arg Leu  
 6355 6360 6365  
 Ser Lys Met Gly Ile Leu Lys Ala Glu Glu Phe Val Ala Ala Ser Asp  
 6370 6375 6380

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Ile Thr Leu Lys Cys Cys Thr Val Thr Tyr Leu Asn Asp Pro Ser Ser  
6385 6390 6395 6400

Lys Thr Val Cys Thr Tyr Met Asp Leu Leu Leu Asp Asp Phe Val Ser  
6405 6410 6415

Val Leu Lys Ser Leu Asp Leu Thr Val Val Ser Lys Val His Glu Val  
6420 6425 6430

Ile Ile Asp Asn Lys Pro Trp Arg Trp Met Leu Trp Cys Lys Asp Asn  
6435 6440 6445

Ala Val Ala Thr Phe Tyr Pro Gln Leu Gln Ser Ala Glu Trp Lys Cys  
6450 6455 6460

Gly Tyr Ser Met Pro Gly Ile Tyr Lys Thr Gln Arg Met Cys Leu Glu  
6465 6470 6475 6480

Pro Cys Asn Leu Tyr Asn Tyr Gly Ala Gly Leu Lys Leu Pro Ser Gly  
6485 6490 6495

Ile Met Phe Asn Val Val Lys Tyr Thr Gln Leu Cys Gln Tyr Phe Asn  
6500 6505 6510

Ser Thr Thr Leu Cys Val Pro His Asn Met Arg Val Leu His Leu Gly  
6515 6520 6525

Ala Gly Ser Asp Tyr Gly Val Ala Pro Gly Thr Ala Val Leu Lys Arg  
6530 6535 6540

Trp Leu Pro His Asp Ala Ile Val Val Asp Asn Asp Val Val Asp Tyr  
6545 6550 6555 6560

Val Ser Asp Ala Asp Phe Ser Val Thr Gly Asp Cys Ala Thr Val Tyr  
6565 6570 6575

Leu Glu Asp Lys Phe Asp Leu Leu Ile Ser Asp Met Tyr Asp Gly Arg  
6580 6585 6590

Thr Lys Ala Ile Asp Gly Glu Asn Val Ser Lys Glu Gly Phe Phe Thr  
6595 6600 6605

Tyr Ile Asn Gly Phe Ile Cys Glu Lys Leu Ala Ile Gly Gly Ser Ile  
6610 6615 6620

Ala Ile Lys Val Thr Glu Tyr Ser Trp Asn Lys Lys Leu Tyr Glu Leu  
6625 6630 6635 6640

Val Gln Arg Phe Ser Phe Trp Thr Met Phe Cys Thr Ser Val Asn Thr  
6645 6650 6655

Ser Ser Ser Glu Ala Phe Val Val Gly Ile Asn Tyr Leu Gly Asp Phe  
6660 6665 6670

Ala Gln Gly Pro Phe Ile Asp Gly Asn Ile Ile His Ala Asn Tyr Val  
6675 6680 6685

Phe Trp Arg Asn Ser Thr Val Met Ser Leu Ser Tyr Asn Ser Val Leu  
6690 6695 6700

Asp Leu Ser Lys Phe Asn Cys Lys His Lys Ala Thr Val Val Val Gln  
6705 6710 6720

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Leu Lys Asp Ser Asp Ile Asn Glu Met Val Leu Ser Leu Val Arg Ser  
6725 6730 6735

Gly Lys Leu Leu Val Arg Gly Asn Gly Lys Cys Leu Ser Phe Ser Asn  
6740 6745 6750

His Leu Val Ser Thr Lys  
6755

<210> 9915  
<211> 448  
<212> PRT  
<213> Human coronavirus OC43

<400> 9915  
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Asn Arg Ser Gly Asn Gly Ile Leu Lys Trp Ala Asp Gln Ser Asp Gln  
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Val Arg Asn Val Gln Thr Arg Gly Arg Arg Ala Gln Pro Lys Gln Thr  
35 40 45

Ala Thr Ser Gln Gln Pro Ser Gly Gly Asn Val Val Pro Tyr Tyr Ser  
50 55 60

Trp Phe Ser Gly Ile Thr Gln Phe Gln Lys Gly Lys Glu Phe Glu Phe  
65 70 75 80

Val Glu Gly Gln Gly Pro Pro Ile Ala Pro Gly Val Pro Ala Thr Glu  
85 90 95

Ala Lys Gly Tyr Trp Tyr Arg His Asn Arg Gly Ser Phe Lys Thr Ala  
100 105 110

Asp Gly Asn Gln Arg Gln Leu Leu Pro Arg Trp Tyr Phe Tyr Tyr Leu  
115 120 125

Gly Thr Gly Pro His Ala Lys Asp Gln Tyr Gly Thr Asp Ile Asp Gly  
130 135 140

Val Tyr Trp Val Ala Ser Asn Gln Ala Asp Val Asn Thr Pro Ala Asp  
145 150 155 160

Ile Val Asp Arg Asp Pro Ser Ser Asp Glu Ala Ile Pro Thr Arg Phe  
165 170 175

Pro Pro Gly Thr Val Leu Pro Gln Gly Tyr Tyr Ile Glu Gly Ser Gly  
180 185 190

Arg Ser Ala Pro Asn Ser Arg Ser Thr Ser Arg Thr Ser Ser Arg Ala  
195 200 205

Ser Ser Ala Gly Ser Arg Ser Arg Ala Asn Ser Gly Asn Arg Thr Pro  
210 215 220

Thr Ser Gly Val Thr Pro Asp Met Ala Asp Gln Ile Ala Ser Leu Val  
225 230 235 240

Leu Ala Lys Leu Gly Lys Asp Ala Thr Lys Pro Gln Gln Val Thr Lys  
245 250 255

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His Thr Ala Lys Glu Val Arg Gln Lys Ile Leu Asn Lys Pro Arg Gln  
 260 265 270  
 Lys Arg Ser Pro Asn Lys Gln Cys Thr Val Gln Gln Cys Phe Gly Lys  
 275 280 285  
 Arg Gly Pro Asn Gln Asn Phe Gly Gly Gly Glu Met Leu Lys Leu Gly  
 290 295 300  
 Thr Ser Asp Pro Gln Phe Pro Ile Leu Ala Glu Leu Ala Pro Thr Ala  
 305 310 315 320  
 Gly Ala Phe Phe Phe Gly Ser Arg Leu Glu Leu Ala Lys Val Gln Asn  
 325 330 335  
 Leu Ser Gly Asn Pro Asp Glu Pro Gln Lys Asp Val Tyr Glu Leu Arg  
 340 345 350  
 Tyr Asn Gly Ala Ile Arg Phe Asp Ser Thr Leu Ser Gly Phe Glu Thr  
 355 360 365  
 Ile Met Lys Val Leu Asn Glu Asn Leu Asn Ala Tyr Gln Gln Gln Asp  
 370 375 380  
 Gly Met Met Asn Met Ser Pro Lys Pro Gln Arg Gln Arg Gly His Lys  
 385 390 395 400  
 Asn Gly Gln Gly Glu Asn Asp Asn Ile Ser Val Ala Val Pro Lys Ser  
 405 410 415  
 Arg Val Gln Gln Asn Lys Ser Arg Glu Leu Thr Ala Glu Asp Ile Ser  
 420 425 430  
 Leu Leu Lys Lys Met Asp Glu Pro Tyr Thr Glu Asp Thr Ser Glu Ile  
 435 440 445

<210> 9916  
 <211> 424  
 <212> PRT  
 <213> Human coronavirus OC43

<400> 9916  
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 Leu Gly Phe Tyr Asn Pro Pro Thr Asn Val Val Ser His Val Asn Gly  
 20 25 30  
 Asp Trp Phe Leu Phe Gly Asp Ser Arg Ser Asp Cys Asn His Ile Val  
 35 40 45  
 Asn Ile Asn Pro His Asn Tyr Ser Tyr Met Asp Leu Asn Pro Val Leu  
 50 55 60  
 Cys Asp Ser Gly Lys Ile Ser Ser Lys Ala Gly Asn Ser Ile Phe Arg  
 65 70 75 80  
 Ser Phe His Phe Thr Asp Phe Tyr Asn Tyr Thr Gly Glu Gly Gln Gln  
 85 90 95  
 Ile Ile Phe Tyr Glu Gly Val Asn Phe Thr Pro Tyr His Ala Phe Lys



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Cys	Asn	Arg	Ser	Gly	Ser	Asn	Asp	Ile	Trp	Met	Gln	Asn	Lys	Gly	Leu
		115					120					125			
Phe	Tyr	Thr	Gln	Val	Tyr	Lys	Asn	Met	Ala	Val	Tyr	Arg	Ser	Leu	Thr
	130					135					140				
Phe	Val	Asn	Val	Pro	Tyr	Val	Tyr	Asn	Gly	Ser	Ala	Gln	Ser	Thr	Ala
145					150					155					160
Leu	Cys	Lys	Ser	Gly	Ser	Leu	Val	Leu	Asn	Asn	Pro	Ala	Tyr	Ile	Ala
				165					170					175	
Pro	Gln	Ala	Asn	Ser	Gly	Asp	Tyr	Tyr	Tyr	Lys	Val	Glu	Ala	Asp	Phe
			180					185					190		
Tyr	Leu	Ser	Gly	Cys	Asp	Glu	Tyr	Ile	Val	Pro	Leu	Cys	Ile	Phe	Asn
		195					200					205			
Gly	Lys	Phe	Leu	Ser	Asn	Thr	Lys	Tyr	Tyr	Asp	Asp	Ser	Gln	Tyr	Tyr
	210					215					220				
Phe	Asn	Lys	Asp	Thr	Gly	Val	Ile	Tyr	Gly	Leu	Asn	Ser	Thr	Glu	Thr
225					230					235					240
Ile	Thr	Thr	Gly	Phe	Asp	Leu	Asn	Cys	Tyr	Tyr	Leu	Val	Leu	Pro	Ser
				245					250					255	
Gly	Asn	Tyr	Leu	Ala	Ile	Ser	Asn	Glu	Leu	Leu	Leu	Thr	Val	Pro	Thr
			260					265					270		
Lys	Ala	Ile	Cys	Leu	Asn	Lys	Arg	Lys	Asp	Phe	Thr	Pro	Val	Gln	Val
		275					280					285			
Val	Asp	Ser	Arg	Trp	Asn	Asn	Ala	Arg	Gln	Ser	Asp	Asn	Met	Thr	Ala
	290					295					300				
Val	Ala	Cys	Gln	Pro	Pro	Tyr	Cys	Tyr	Phe	Arg	Asn	Ser	Thr	Thr	Asn
305					310					315					320
Tyr	Val	Gly	Val	Tyr	Asp	Ile	Asn	His	Gly	Asp	Ala	Gly	Phe	Thr	Ser
				325					330					335	
Ile	Leu	Ser	Gly	Leu	Leu	Tyr	Asn	Ser	Pro	Cys	Phe	Ser	Gln	Gln	Gly
			340					345					350		
Val	Phe	Arg	Tyr	Asp	Asn	Val	Ser	Ser	Val	Trp	Pro	Leu	Tyr	Pro	Tyr
		355					360					365			
Gly	Arg	Cys	Pro	Thr	Ala	Ala	Asp	Ile	Asn	Asn	Pro	Asp	Leu	Pro	Ile
	370					375					380				
Cys	Val	Tyr	Asp	Pro	Leu	Pro	Val	Ile	Leu	Leu	Gly	Ile	Leu	Leu	Gly
385					390					395					400
Val	Ala	Val	Ile	Ile	Ile	Val	Val	Leu	Leu	Leu	Tyr	Phe	Met	Val	Asp
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Asn	Gly	Thr	Arg	Leu	His	Asp	Ala								
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<210> 9917

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<211> 230  
 <212> PRT  
 <213> Human coronavirus OC43

<400> 9917  
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 Leu Leu Phe Ile Thr Ile Ile Leu Gln Phe Gly Tyr Thr Ser Arg Ser  
 35 40 45  
 Met Phe Val Tyr Val Ile Lys Met Ile Ile Leu Trp Leu Met Trp Pro  
 50 55 60  
 Leu Thr Ile Ile Leu Thr Ile Phe Asn Cys Val Tyr Ala Leu Asn Asn  
 65 70 75 80  
 Val Tyr Leu Gly Leu Ser Ile Val Phe Thr Ile Val Ala Ile Ile Met  
 85 90 95  
 Trp Ile Val Tyr Phe Val Asn Ser Ile Arg Leu Phe Ile Arg Thr Gly  
 100 105 110  
 Ser Phe Trp Ser Phe Asn Pro Glu Thr Asn Asn Leu Met Cys Ile Asp  
 115 120 125  
 Met Lys Gly Thr Met Tyr Val Arg Pro Ile Ile Glu Asp Tyr His Thr  
 130 135 140  
 Leu Thr Val Thr Ile Ile Arg Gly His Leu Tyr Ile Gln Gly Ile Lys  
 145 150 155 160  
 Leu Gly Thr Gly Tyr Ser Trp Ala Asp Leu Pro Ala Tyr Met Thr Val  
 165 170 175  
 Ala Lys Val Thr His Leu Cys Thr Tyr Lys Arg Gly Phe Leu Asp Arg  
 180 185 190  
 Ile Ser Asp Thr Ser Gly Phe Ala Val Tyr Val Lys Ser Lys Val Gly  
 195 200 205  
 Asn Tyr Arg Leu Pro Ser Thr Gln Lys Gly Ser Gly Met Asp Thr Ala  
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 Leu Leu Arg Asn Asn Ile  
 225 230

<210> 9918  
 <211> 1353  
 <212> PRT  
 <213> Human coronavirus OC43

<400> 9918  
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 Gly Asp Leu Lys Cys Thr Ser Asp Asn Ile Asn Asp Lys Asp Thr Gly  
 20 25 30  
 Pro Pro Pro Ile Ser Thr Asp Thr Val Asp Val Thr Asn Gly Leu Gly

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35				40				45							
Thr	Tyr	Tyr	Val	Leu	Asp	Arg	Val	Tyr	Leu	Asn	Thr	Thr	Leu	Phe	Leu
	50					55					60				
Asn	Gly	Tyr	Tyr	Pro	Thr	Ser	Gly	Ser	Thr	Tyr	Arg	Asn	Met	Ala	Leu
65					70					75					80
Lys	Gly	Ser	Val	Leu	Leu	Ser	Arg	Leu	Trp	Phe	Lys	Pro	Pro	Phe	Leu
				85					90					95	
Ser	Asp	Phe	Ile	Asn	Gly	Ile	Phe	Ala	Lys	Val	Lys	Asn	Thr	Lys	Val
			100					105					110		
Ile	Lys	Asp	Arg	Val	Met	Tyr	Ser	Glu	Phe	Pro	Ala	Ile	Thr	Ile	Gly
		115					120					125			
Ser	Thr	Phe	Val	Asn	Thr	Ser	Tyr	Ser	Val	Val	Val	Gln	Pro	Arg	Thr
	130					135					140				
Ile	Asn	Ser	Thr	Gln	Asp	Gly	Asp	Asn	Lys	Leu	Gln	Gly	Leu	Leu	Glu
145					150					155					160
Val	Ser	Val	Cys	Gln	Tyr	Asn	Met	Cys	Glu	Tyr	Pro	Gln	Thr	Ile	Cys
				165					170					175	
His	Pro	Asn	Leu	Gly	Asn	His	Arg	Lys	Glu	Leu	Trp	His	Leu	Asp	Thr
			180					185					190		
Gly	Val	Val	Ser	Cys	Leu	Tyr	Lys	Arg	Asn	Phe	Thr	Tyr	Asp	Val	Asn
		195					200						205		
Ala	Asp	Tyr	Leu	Tyr	Phe	His	Phe	Tyr	Gln	Glu	Gly	Gly	Thr	Phe	Tyr
	210					215					220				
Ala	Tyr	Phe	Thr	Asp	Thr	Gly	Val	Val	Thr	Lys	Phe	Leu	Phe	Asn	Val
225					230					235					240
Tyr	Leu	Gly	Met	Ala	Leu	Ser	His	Tyr	Tyr	Val	Met	Pro	Leu	Thr	Cys
				245					250					255	
Asn	Ser	Lys	Leu	Thr	Leu	Glu	Tyr	Trp	Val	Thr	Pro	Leu	Thr	Ser	Arg
			260					265					270		
Gln	Tyr	Leu	Leu	Ala	Phe	Asn	Gln	Asp	Gly	Ile	Ile	Phe	Asn	Ala	Glu
		275					280					285			
Asp	Cys	Met	Ser	Asp	Phe	Met	Ser	Glu	Ile	Lys	Cys	Lys	Thr	Gln	Ser
	290					295					300				
Ile	Ala	Pro	Pro	Thr	Gly	Val	Tyr	Glu	Leu	Asn	Gly	Tyr	Thr	Val	Gln
305					310					315					320
Pro	Ile	Ala	Asp	Val	Tyr	Arg	Arg	Lys	Pro	Asn	Leu	Pro	Asn	Cys	Asn
				325					330					335	
Ile	Glu	Ala	Trp	Leu	Asn	Asp	Lys	Ser	Val	Pro	Ser	Pro	Leu	Asn	Trp
			340					345					350		
Glu	Arg	Lys	Thr	Phe	Ser	Asn	Cys	Asn	Phe	Asn	Met	Ser	Ser	Leu	Met
		355					360					365			
Ser	Phe	Ile	Gln	Ala	Asp	Ser	Phe	Thr	Cys	Asn	Asn	Ile	Asp	Ala	Ala

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370                               375                               380
Lys Ile Tyr Gly Met Cys Phe Ser Ser Ile Thr Ile Asp Lys Phe Ala
385                               390                               400
Ile Pro Asn Gly Arg Lys Val Asp Leu Gln Leu Gly Asn Leu Gly Tyr
405                               410                               415
Leu Gln Ser Phe Asn Tyr Arg Ile Asp Thr Thr Ala Thr Ser Cys Gln
420                               425                               430
Leu Tyr Tyr Asn Leu Pro Ala Ala Asn Val Ser Val Ser Arg Phe Asn
435                               440                               445
Pro Ser Thr Trp Asn Lys Arg Phe Gly Phe Ile Glu Asp Ser Val Phe
450                               455                               460
Lys Pro Arg Pro Ala Gly Val Leu Thr Asn His Asp Val Val Tyr Ala
465                               470                               475
Gln His Cys Phe Lys Ala Pro Lys Asn Phe Cys Pro Cys Lys Leu Asn
485                               490                               495
Gly Ser Cys Val Gly Ser Gly Pro Gly Lys Asn Asn Gly Ile Gly Thr
500                               505                               510
Cys Pro Ala Gly Thr Asn Tyr Leu Thr Cys Asp Asn Leu Cys Thr Pro
515                               520                               525
Asp Pro Ile Thr Phe Thr Gly Thr Tyr Lys Cys Pro Gln Thr Lys Ser
530                               535                               540
Leu Val Gly Ile Gly Glu His Cys Ser Gly Leu Ala Val Lys Ser Asp
545                               550                               555
Tyr Cys Gly Gly Asn Ser Cys Thr Cys Arg Pro Gln Ala Phe Leu Gly
565                               570                               575
Trp Ser Ala Asp Ser Cys Leu Gln Gly Asp Lys Cys Asn Ile Phe Ala
580                               585                               590
Asn Phe Ile Leu His Asp Val Asn Ser Gly Leu Thr Cys Ser Thr Asp
595                               600                               605
Leu Gln Lys Ala Asn Thr Asp Ile Ile Leu Gly Val Cys Val Asn Tyr
610                               615                               620
Asp Leu Tyr Gly Ile Leu Gly Gln Gly Ile Phe Val Glu Val Asn Ala
625                               630                               635
Thr Tyr Tyr Asn Ser Trp Gln Asn Leu Leu Tyr Asp Ser Asn Gly Asn
645                               650                               655
Leu Tyr Gly Phe Arg Asp Tyr Ile Ile Asn Arg Thr Phe Met Ile Arg
660                               665                               670
Ser Cys Tyr Ser Gly Arg Val Ser Ala Ala Phe His Ala Asn Ser Ser
675                               680                               685
Glu Pro Ala Leu Leu Phe Arg Asn Ile Lys Cys Asn Tyr Val Phe Asn
690                               695                               700
Asn Ser Leu Thr Arg Gln Leu Gln Pro Ile Asn Tyr Phe Asp Ser Tyr

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705					710					715					720
Leu	Gly	Cys	Val	Val	Asn	Ala	Tyr	Asn	Ser	Thr	Ala	Ile	Ser	Val	Gln
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Thr	Cys	Asp	Leu	Thr	Val	Gly	Ser	Gly	Tyr	Cys	Val	Asp	Tyr	Ser	Lys
			740					745					750		
Asn	Arg	Arg	Ser	Arg	Gly	Ala	Ile	Thr	Thr	Gly	Tyr	Arg	Phe	Thr	Asn
		755					760					765			
Phe	Glu	Pro	Phe	Thr	Val	Asn	Ser	Val	Asn	Asp	Ser	Leu	Glu	Pro	Val
	770					775					780				
Gly	Gly	Leu	Tyr	Glu	Ile	Gln	Ile	Pro	Ser	Glu	Phe	Thr	Ile	Gly	Asn
785					790					795					800
Met	Val	Glu	Phe	Ile	Gln	Thr	Ser	Ser	Pro	Lys	Val	Thr	Ile	Asp	Cys
				805					810					815	
Ala	Ala	Phe	Val	Cys	Gly	Asp	Tyr	Ala	Ala	Cys	Lys	Ser	Gln	Leu	Val
			820					825					830		
Glu	Tyr	Gly	Ser	Phe	Cys	Asp	Asn	Ile	Asn	Ala	Ile	Leu	Thr	Glu	Val
		835					840					845			
Asn	Glu	Leu	Leu	Asp	Thr	Thr	Gln	Leu	Gln	Val	Ala	Asn	Ser	Leu	Met
	850					855					860				
Asn	Gly	Val	Thr	Leu	Ser	Thr	Lys	Leu	Lys	Asp	Gly	Val	Asn	Phe	Asn
865					870					875					880
Val	Asp	Asp	Ile	Asn	Phe	Ser	Pro	Val	Leu	Gly	Cys	Leu	Gly	Ser	Glu
				885					890					895	
Cys	Ser	Lys	Ala	Ser	Ser	Arg	Ser	Ala	Ile	Glu	Asp	Leu	Leu	Phe	Asp
			900					905					910		
Lys	Val	Lys	Leu	Ser	Asp	Val	Gly	Phe	Val	Glu	Ala	Tyr	Asn	Asn	Cys
		915					920					925			
Thr	Gly	Gly	Ala	Glu	Ile	Arg	Asp	Leu	Ile	Cys	Val	Gln	Ser	Tyr	Lys
	930					935					940				
Gly	Ile	Lys	Val	Leu	Pro	Pro	Leu	Leu	Ser	Glu	Asn	Gln	Ile	Ser	Gly
945					950					955					960
Tyr	Thr	Leu	Ala	Ala	Thr	Ser	Ala	Ser	Leu	Phe	Pro	Pro	Trp	Thr	Ala
				965					970					975	
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cgtgcgaca	tcaaggacct	gccccaggag	atcaccgtgg	ccaccagccg	caccctgagc	540
tactacaagc	tgggcgcag	ccagcgctg	ggcaccgaca	gcggcttcgc	cgccataaac	600
cgctaccgca	tcggcaacta	caagctgaac	accgaccacg	ccggcagcaa	cgacaacatc	660

gccctgctgg tgcaggccta aagaattc

688

<210> 9926

<211> 252

<212> DNA

<213> Artificial Sequence

<220>

<223> optimized envelope sequence

<400> 9926

gtcgcagcca	ccatgtacag	cttcgtgagc	gaggagaccg	gcaccctgat	cgtgaacagc	60
gtgctgctgt	tcctggcctt	cgtggtgttc	ctgctggtga	ccctggccat	cctgaccgcc	120
ctgcgcctgt	gcgcctactg	ctgcaacatc	gtgaacgtga	gcctggtgaa	gcccaccgtg	180
tacgtgtaca	gccgcgtgaa	gaacctgaac	agcagcgagg	gcgtgcccga	cctgctggtg	240
gcctaagaat	tc					252

<210> 9927

<211> 302

<212> DNA

<213> Artificial Sequence

<220>

<223> SARS coronavirus amplicon BNI-1

<400> 9927

taccgtagac	tcattcttat	gatgggtttc	aaaatgaatt	accaagtcaa	tggttacccct	60
aatatgttta	tcacccgcga	agaagctatt	cgtcacgttc	gtgcgtggat	tggctttgat	120
gtagagggct	gtcatgcaac	tagagatgct	gtgggtacta	acctacctct	ccagctagga	180
ttttctacag	gtgttaactt	agtagctgta	ccgactgggt	atgttgacac	tgaaaataac	240
acagaattca	ccagagttaa	tgcaaaacct	ccaccagggtg	accagtttaa	acatcttata	300
cc						302

<210> 9928

<211> 100

<212> PRT

<213> Artificial Sequence

<220>

<223> Inferred translation product from SEQ ID NO: 9927

<400> 9928

Tyr	Arg	Arg	Leu	Ile	Ser	Met	Met	Gly	Phe	Lys	Met	Asn	Tyr	Gln	Val	1	5	10	15
Asn	Gly	Tyr	Pro	Asn	Met	Phe	Ile	Thr	Arg	Glu	Glu	Ala	Ile	Arg	His	20	25	30	
Val	Arg	Ala	Trp	Ile	Gly	Phe	Asp	Val	Glu	Gly	Cys	His	Ala	Thr	Arg	35	40	45	
Asp	Ala	Val	Gly	Thr	Asn	Leu	Pro	Leu	Gln	Leu	Gly	Phe	Ser	Thr	Gly	50	55	60	
Val	Asn	Leu	Val	Ala	Val	Pro	Thr	Gly	Tyr	Val	Asp	Thr	Glu	Asn	Asn	65	70	75	80
Thr	Glu	Phe	Thr	Arg	Val	Asn	Ala	Lys	Pro	Pro	Pro	Gly	Asp	Gln	Phe	85	90	95	
Lys	His	Leu	Ile													100			

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<210> 9929  
 <211> 6  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Inferred translation product from SEQ ID NO: 9927

<400> 9929  
 Thr Val Asp Ser Ser Leu  
 1 5

<210> 9930  
 <211> 4  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Inferred translation product from SEQ ID NO: 9927

<400> 9930  
 Trp Val Ser Lys  
 1

<210> 9931  
 <211> 28  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Inferred translation product from SEQ ID NO: 9927

<400> 9931  
 Ile Thr Lys Ser Met Val Thr Leu Ile Cys Leu Ser Pro Ala Lys Lys  
 1 5 10 15  
 Leu Phe Val Thr Phe Val Arg Gly Leu Ala Leu Met  
 20 25

<210> 9932  
 <211> 17  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Inferred translation product from SEQ ID NO: 9927

<400> 9932  
 Arg Ala Val Met Gln Leu Glu Met Leu Trp Val Leu Thr Tyr Leu Ser  
 1 5 10 15  
 Ser

<210> 9933  
 <211> 7  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Inferred translation product from SEQ ID NO: 9927

<400> 9933

SEQLIST-20480.TXT

Asp Phe Leu Gln Val Leu Thr  
1 5

<210> 9934  
<211> 32  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Inferred translation product from SEQ ID NO: 9927

<400> 9934  
Leu Tyr Arg Leu Val Met Leu Thr Leu Lys Ile Thr Gln Asn Ser Pro  
1 5 10 15

Glu Leu Met Gln Asn Leu His Gln Val Thr Ser Leu Asn Ile Leu Tyr  
20 25 30

<210> 9935  
<211> 17  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Inferred translation product from SEQ ID NO: 9927

<400> 9935  
Thr His Leu Tyr Asp Gly Phe Gln Asn Glu Leu Pro Ser Gln Trp Leu  
1 5 10 15

Pro

<210> 9936  
<211> 18  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Inferred translation product from SEQ ID NO: 9927

<400> 9936  
Tyr Val Tyr His Pro Arg Arg Ser Tyr Ser Ser Arg Ser Cys Val Asp  
1 5 10 15

Trp Leu

<210> 9937  
<211> 7  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Inferred translation product from SEQ ID NO: 9927

<400> 9937  
Cys Arg Gly Leu Ser Cys Asn  
1 5

<210> 9938  
<211> 5



SEQLIST-20480.TXT

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<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Inferred translation product from SEQ ID NO: 9927

<400>  9938
Arg Cys Cys Gly Tyr
1      5

<210>  9939
<211>  11
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Inferred translation product from SEQ ID NO: 9927

<400>  9939
Pro Thr Ser Pro Ala Arg Ile Phe Tyr Arg Cys
1      5      10

<210>  9940
<211>  9
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Inferred translation product from SEQ ID NO: 9927

<400>  9940
Leu Ser Ser Cys Thr Asp Trp Leu Cys
1      5

<210>  9941
<211>  6
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Inferred translation product from SEQ ID NO: 9927

<400>  9941
His Arg Ile His Gln Ser
1      5

<210>  9942
<211>  6
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Inferred translation product from SEQ ID NO: 9927

<400>  9942
Cys Lys Thr Ser Thr Arg
1      5

<210>  9943
<211>  4
<212>  PRT
<213>  Artificial Sequence

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SEQLIST-20480.TXT

<220>

<223> Inferred translation product from SEQ ID NO: 9927

<400> 9943

Thr Ser Tyr Thr  
1

<210> 9944

<211> 27

<212> PRT

<213> Artificial Sequence

<220>

<223> Inferred translation product from SEQ ID NO: 9927

<400> 9944

Gly Ile Arg Cys Leu Asn Trp Ser Pro Gly Gly Gly Phe Ala Leu Thr  
1 5 10 15

Leu Val Asn Ser Val Leu Phe Ser Val Ser Thr  
20 25

<210> 9945

<211> 28

<212> PRT

<213> Artificial Sequence

<220>

<223> Inferred translation product from SEQ ID NO: 9927

<400> 9945

Pro Val Gly Thr Ala Thr Lys Leu Thr Pro Val Glu Asn Pro Ser Trp  
1 5 10 15

Arg Gly Arg Leu Val Pro Thr Ala Ser Leu Val Ala  
20 25

<210> 9946

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Inferred translation product from SEQ ID NO: 9927

<400> 9946

Gln Pro Ser Thr Ser Lys Pro Ile His Ala Arg Thr  
1 5 10

<210> 9947

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Inferred translation product from SEQ ID NO: 9927

<400> 9947

Arg Ile Ala Ser Ser Arg Val Ile Asn Ile Leu Gly  
1 5 10

<210> 9948

<211> 4

SEQLIST-20480.TXT

<212> PRT  
<213> Artificial Sequence

<220>  
<223> Inferred translation product from SEQ ID NO: 9927

<400> 9948  
Pro Leu Thr Trp  
1

<210> 9949  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Inferred translation product from SEQ ID NO: 9927

<400> 9949  
Phe Ile Leu Lys Pro Ile Ile Glu Met Ser Leu Arg  
1 5 10

<210> 9950  
<211> 9  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Inferred translation product from SEQ ID NO: 9927

<400> 9950  
Thr Gly His Leu Val Glu Val Leu His  
1 5

<210> 9951  
<211> 17  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Inferred translation product from SEQ ID NO: 9927

<400> 9951  
Ile Leu Cys Tyr Phe Gln Cys Gln His Asn Gln Ser Val Gln Leu Leu  
1 5 10 15

Ser

<210> 9952  
<211> 8  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Inferred translation product from SEQ ID NO: 9927

<400> 9952  
Lys Ile Leu Ala Gly Glu Val Gly  
1 5

<210> 9953  
<211> 5

SEQLIST-20480.TXT

<212> PRT  
<213> Artificial Sequence

<220>  
<223> Inferred translation product from SEQ ID NO: 9927

<400> 9953  
Tyr Pro Gln His Leu  
1 5

<210> 9954  
<211> 17  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Inferred translation product from SEQ ID NO: 9927

<400> 9954  
Leu His Asp Ser Pro Leu His Gln Ser Gln Ser Thr His Glu Arg Asp  
1 5 10 15

Glu

<210> 9955  
<211> 4  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Inferred translation product from SEQ ID NO: 9927

<400> 9955  
Leu Leu Arg Gly  
1

<210> 9956  
<211> 5  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Inferred translation product from SEQ ID NO: 9927

<400> 9956  
Leu Gly Asn Ser Phe  
1 5

<210> 9957  
<211> 33  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Inferred translation product from SEQ ID NO: 9927

<400> 9957  
Tyr Lys Met Phe Lys Leu Val Thr Trp Trp Arg Phe Cys Ile Asn Ser  
1 5 10 15

Gly Glu Phe Cys Val Ile Phe Ser Val Asn Ile Thr Ser Arg Tyr Ser  
20 25 30

SEQLIST-20480.TXT

Tyr

<210> 9958  
 <211> 7  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Inferred translation product from SEQ ID NO: 9927

<400> 9958  
 Val Asn Thr Cys Arg Lys Ser  
 1 5

<210> 9959  
 <211> 54  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Inferred translation product from SEQ ID NO: 9927

<400> 9959  
 Val Ser Thr His Ser Ile Ser Ser Cys Met Thr Ala Leu Tyr Ile Lys  
 1 5 10 15

Ala Asn Pro Arg Thr Asn Val Thr Asn Ser Phe Phe Ala Gly Asp Lys  
 20 25 30

His Ile Arg Val Thr Ile Asp Leu Val Ile His Phe Glu Thr His His  
 35 40 45

Arg Asp Glu Ser Thr Val  
 50

<210> 9960  
 <211> 7073  
 <212> PRT  
 <213> SARS coronavirus

<400> 9960  
 Met Glu Ser Leu Val Leu Gly Val Asn Glu Lys Thr His Val Gln Leu  
 1 5 10 15

Ser Leu Pro Val Leu Gln Val Arg Asp Val Leu Val Arg Gly Phe Gly  
 20 25 30

Asp Ser Val Glu Glu Ala Leu Ser Glu Ala Arg Glu His Leu Lys Asn  
 35 40 45

Gly Thr Cys Gly Leu Val Glu Leu Glu Lys Gly Val Leu Pro Gln Leu  
 50 55 60

Glu Gln Pro Tyr Val Phe Ile Lys Arg Ser Asp Ala Leu Ser Thr Asn  
 65 70 75 80

His Gly His Lys Val Val Glu Leu Val Ala Glu Met Asp Gly Ile Gln  
 85 90 95

Tyr Gly Arg Ser Gly Ile Thr Leu Gly Val Leu Val Pro His Val Gly  
 100 105 110

SEQLIST-20480.TXT

Glu Thr Pro Ile Ala Tyr Arg Asn Val Leu Leu Arg Lys Asn Gly Asn  
 115 120 125  
 Lys Gly Ala Gly Gly His Ser Tyr Gly Ile Asp Leu Lys Ser Tyr Asp  
 130 135 140  
 Leu Gly Asp Glu Leu Gly Thr Asp Pro Ile Glu Asp Tyr Glu Gln Asn  
 145 150 155 160  
 Trp Asn Thr Lys His Gly Ser Gly Ala Leu Arg Glu Leu Thr Arg Glu  
 165 170 175  
 Leu Asn Gly Gly Ala Val Thr Arg Tyr Val Asp Asn Asn Phe Cys Gly  
 180 185 190  
 Pro Asp Gly Tyr Pro Leu Asp Cys Ile Lys Asp Phe Leu Ala Arg Ala  
 195 200 205  
 Gly Lys Ser Met Cys Thr Leu Ser Glu Gln Leu Asp Tyr Ile Glu Ser  
 210 215 220  
 Lys Arg Gly Val Tyr Cys Cys Arg Asp His Glu His Glu Ile Ala Trp  
 225 230 235 240  
 Phe Thr Glu Arg Ser Asp Lys Ser Tyr Glu His Gln Thr Pro Phe Glu  
 245 250 255  
 Ile Lys Ser Ala Lys Lys Phe Asp Thr Phe Lys Gly Glu Cys Pro Lys  
 260 265 270  
 Phe Val Phe Pro Leu Asn Ser Lys Val Lys Val Ile Gln Pro Arg Val  
 275 280 285  
 Glu Lys Lys Lys Thr Glu Gly Phe Met Gly Arg Ile Arg Ser Val Tyr  
 290 295 300  
 Pro Val Ala Ser Pro Gln Glu Cys Asn Asn Met His Leu Ser Thr Leu  
 305 310 315 320  
 Met Lys Cys Asn His Cys Asp Glu Val Ser Trp Gln Thr Cys Asp Phe  
 325 330 335  
 Leu Lys Ala Thr Cys Glu His Cys Gly Thr Glu Asn Leu Val Ile Glu  
 340 345 350  
 Gly Pro Thr Thr Cys Gly Tyr Leu Pro Thr Asn Ala Val Val Lys Met  
 355 360 365  
 Pro Cys Pro Ala Cys Gln Asp Pro Glu Ile Gly Pro Glu His Ser Val  
 370 375 380  
 Ala Asp Tyr His Asn His Ser Asn Ile Glu Thr Arg Leu Arg Lys Gly  
 385 390 395 400  
 Gly Arg Thr Arg Cys Phe Gly Gly Cys Val Phe Ala Tyr Val Gly Cys  
 405 410 415  
 Tyr Asn Lys Arg Ala Tyr Trp Val Pro Arg Ala Ser Ala Asp Ile Gly  
 420 425 430  
 Ser Gly His Thr Gly Ile Thr Gly Asp Asn Val Glu Thr Leu Asn Glu  
 435 440 445

SEQLIST-20480.TXT

Asp Leu Leu Glu Ile Leu Ser Arg Glu Arg Val Asn Ile Asn Ile Val  
 450 455 460  
 Gly Asp Phe His Leu Asn Glu Glu Val Ala Ile Ile Leu Ala Ser Phe  
 465 470 475 480  
 Ser Ala Ser Thr Ser Ala Phe Ile Asp Thr Ile Lys Ser Leu Asp Tyr  
 485 490 495  
 Lys Ser Phe Lys Thr Ile Val Glu Ser Cys Gly Asn Tyr Lys Val Thr  
 500 505 510  
 Lys Gly Lys Pro Val Lys Gly Ala Trp Asn Ile Gly Gln Gln Arg Ser  
 515 520 525  
 Val Leu Thr Pro Leu Cys Gly Phe Pro Ser Gln Ala Ala Gly Val Ile  
 530 535 540  
 Arg Ser Ile Phe Ala Arg Thr Leu Asp Ala Ala Asn His Ser Ile Pro  
 545 550 555 560  
 Asp Leu Gln Arg Ala Ala Val Thr Ile Leu Asp Gly Ile Ser Glu Gln  
 565 570 575  
 Ser Leu Arg Leu Val Asp Ala Met Val Tyr Thr Ser Asp Leu Leu Thr  
 580 585 590  
 Asn Ser Val Ile Ile Met Ala Tyr Val Thr Gly Gly Leu Val Gln Gln  
 595 600 605  
 Thr Ser Gln Trp Leu Ser Asn Leu Leu Gly Thr Thr Val Glu Lys Leu  
 610 615 620  
 Arg Pro Ile Phe Glu Trp Ile Glu Ala Lys Leu Ser Ala Gly Val Glu  
 625 630 635 640  
 Phe Leu Lys Asp Ala Trp Glu Ile Leu Lys Phe Leu Ile Thr Gly Val  
 645 650 655  
 Phe Asp Ile Val Lys Gly Gln Ile Gln Val Ala Ser Asp Asn Ile Lys  
 660 665 670  
 Asp Cys Val Lys Cys Phe Ile Asp Val Val Asn Lys Ala Leu Glu Met  
 675 680 685  
 Cys Ile Asp Gln Val Thr Ile Ala Gly Ala Lys Leu Arg Ser Leu Asn  
 690 695 700  
 Leu Gly Glu Val Phe Ile Ala Gln Ser Lys Gly Leu Tyr Arg Gln Cys  
 705 710 715 720  
 Ile Arg Gly Lys Glu Gln Leu Gln Leu Leu Met Pro Leu Lys Ala Pro  
 725 730 735  
 Lys Glu Val Thr Phe Leu Glu Gly Asp Ser His Asp Thr Val Leu Thr  
 740 745 750  
 Ser Glu Glu Val Val Leu Lys Asn Gly Glu Leu Glu Thr Leu Glu Thr  
 755 760 765  
 Pro Val Asp Ser Phe Thr Asn Gly Ala Ile Val Gly Thr Pro Val Cys  
 770 775 780

SEQLIST-20480.TXT

Val Asn Gly Leu Met Leu Leu Glu Ile Lys Asp Lys Glu Gln Tyr Cys  
 785 790 795 800  
 Ala Leu Ser Pro Gly Leu Leu Ala Thr Asn Asn Val Phe Arg Leu Lys  
 805 810 815  
 Gly Gly Ala Pro Ile Lys Gly Val Thr Phe Gly Glu Asp Thr Val Trp  
 820 825 830  
 Glu Val Gln Gly Tyr Lys Asn Val Arg Ile Thr Phe Glu Leu Asp Glu  
 835 840 845  
 Arg Val Asp Lys Val Leu Asn Glu Lys Cys Ser Val Tyr Thr Val Glu  
 850 855 860  
 Ser Gly Thr Glu Val Thr Glu Phe Ala Cys Val Val Ala Glu Ala Val  
 865 870 875 880  
 Val Lys Thr Leu Gln Pro Val Ser Asp Leu Leu Thr Asn Met Gly Ile  
 885 890 895  
 Asp Leu Asp Glu Trp Ser Val Ala Thr Phe Tyr Leu Phe Asp Asp Ala  
 900 905 910  
 Gly Glu Glu Asn Phe Ser Ser Arg Met Tyr Cys Ser Phe Tyr Pro Pro  
 915 920 925  
 Asp Glu Glu Glu Glu Asp Asp Ala Glu Cys Glu Glu Glu Glu Ile Asp  
 930 935 940  
 Glu Thr Cys Glu His Glu Tyr Gly Thr Glu Asp Asp Tyr Gln Gly Leu  
 945 950 955 960  
 Pro Leu Glu Phe Gly Ala Ser Ala Glu Thr Val Arg Val Glu Glu Glu  
 965 970 975  
 Glu Glu Glu Asp Trp Leu Asp Asp Thr Thr Glu Gln Ser Glu Ile Glu  
 980 985 990  
 Pro Glu Pro Glu Pro Thr Pro Glu Glu Pro Val Asn Gln Phe Thr Gly  
 995 1000 1005  
 Tyr Leu Lys Leu Thr Asp Asn Val Ala Ile Lys Cys Val Asp Ile Val  
 1010 1015 1020  
 Lys Glu Ala Gln Ser Ala Asn Pro Met Val Ile Val Asn Ala Ala Asn  
 1025 1030 1035 1040  
 Ile His Leu Lys His Gly Gly Gly Val Ala Gly Ala Leu Asn Lys Ala  
 1045 1050 1055  
 Thr Asn Gly Ala Met Gln Lys Glu Ser Asp Asp Tyr Ile Lys Leu Asn  
 1060 1065 1070  
 Gly Pro Leu Thr Val Gly Gly Ser Cys Leu Leu Ser Gly His Asn Leu  
 1075 1080 1085  
 Ala Lys Lys Cys Leu His Val Val Gly Pro Asn Leu Asn Ala Gly Glu  
 1090 1095 1100  
 Asp Ile Gln Leu Leu Lys Ala Ala Tyr Glu Asn Phe Asn Ser Gln Asp  
 1105 1110 1115 1120



SEQLIST-20480.TXT

Ile Leu Leu Ala Pro Leu Leu Ser Ala Gly Ile Phe Gly Ala Lys Pro  
1125 1130 1135  
Leu Gln Ser Leu Gln Val Cys Val Gln Thr Val Arg Thr Gln Val Tyr  
1140 1145 1150  
Ile Ala Val Asn Asp Lys Ala Leu Tyr Glu Gln Val Val Met Asp Tyr  
1155 1160 1165  
Leu Asp Asn Leu Lys Pro Arg Val Glu Ala Pro Lys Gln Glu Glu Pro  
1170 1175 1180  
Pro Asn Thr Glu Asp Ser Lys Thr Glu Glu Lys Ser Val Val Gln Lys  
1185 1190 1195 1200  
Pro Val Asp Val Lys Pro Lys Ile Lys Ala Cys Ile Asp Glu Val Thr  
1205 1210 1215  
Thr Thr Leu Glu Glu Thr Lys Phe Leu Thr Asn Lys Leu Leu Leu Phe  
1220 1225 1230  
Ala Asp Ile Asn Gly Lys Leu Tyr His Asp Ser Gln Asn Met Leu Arg  
1235 1240 1245  
Gly Glu Asp Met Ser Phe Leu Glu Lys Asp Ala Pro Tyr Met Val Gly  
1250 1255 1260  
Asp Val Ile Thr Ser Gly Asp Ile Thr Cys Val Val Ile Pro Ser Lys  
1265 1270 1275 1280  
Lys Ala Gly Gly Thr Thr Glu Met Leu Ser Arg Ala Leu Lys Lys Val  
1285 1290 1295  
Pro Val Asp Glu Tyr Ile Thr Thr Tyr Pro Gly Gln Gly Cys Ala Gly  
1300 1305 1310  
Tyr Thr Leu Glu Glu Ala Lys Thr Ala Leu Lys Lys Cys Lys Ser Ala  
1315 1320 1325  
Phe Tyr Val Leu Pro Ser Glu Ala Pro Asn Ala Lys Glu Glu Ile Leu  
1330 1335 1340  
Gly Thr Val Ser Trp Asn Leu Arg Glu Met Leu Ala His Ala Glu Glu  
1345 1350 1355 1360  
Thr Arg Lys Leu Met Pro Ile Cys Met Asp Val Arg Ala Ile Met Ala  
1365 1370 1375  
Thr Ile Gln Arg Lys Tyr Lys Gly Ile Lys Ile Gln Glu Gly Ile Val  
1380 1385 1390  
Asp Tyr Gly Val Arg Phe Phe Phe Tyr Thr Ser Lys Glu Pro Val Ala  
1395 1400 1405  
Ser Ile Ile Thr Lys Leu Asn Ser Leu Asn Glu Pro Leu Val Thr Met  
1410 1415 1420  
Pro Ile Gly Tyr Val Thr His Gly Phe Asn Leu Glu Glu Ala Ala Arg  
1425 1430 1435 1440  
Cys Met Arg Ser Leu Lys Ala Pro Ala Val Val Ser Val Ser Ser Pro  
1445 1450 1455

SEQLIST-20480.TXT

Asp Ala Val Thr Thr Tyr Asn Gly Tyr Leu Thr Ser Ser Ser Lys Thr  
 1460 1465 1470  
 Ser Glu Glu His Phe Val Glu Thr Val Ser Leu Ala Gly Ser Tyr Arg  
 1475 1480 1485  
 Asp Trp Ser Tyr Ser Gly Gln Arg Thr Glu Leu Gly Val Glu Phe Leu  
 1490 1495 1500  
 Lys Arg Gly Asp Lys Ile Val Tyr His Thr Leu Glu Ser Pro Val Glu  
 1505 1510 1515 1520  
 Phe His Leu Asp Gly Glu Val Leu Ser Leu Asp Lys Leu Lys Ser Leu  
 1525 1530 1535  
 Leu Ser Leu Arg Glu Val Lys Thr Ile Lys Val Phe Thr Thr Val Asp  
 1540 1545 1550  
 Asn Thr Asn Leu His Thr Gln Leu Val Asp Met Ser Met Thr Tyr Gly  
 1555 1560 1565  
 Gln Gln Phe Gly Pro Thr Tyr Leu Asp Gly Ala Asp Val Thr Lys Ile  
 1570 1575 1580  
 Lys Pro His Val Asn His Glu Gly Lys Thr Phe Phe Val Leu Pro Ser  
 1585 1590 1595 1600  
 Asp Asp Thr Leu Arg Ser Glu Ala Phe Glu Tyr Tyr His Thr Leu Asp  
 1605 1610 1615  
 Glu Ser Phe Leu Gly Arg Tyr Met Ser Ala Leu Asn His Thr Lys Lys  
 1620 1625 1630  
 Trp Lys Phe Pro Gln Val Gly Gly Leu Thr Ser Ile Lys Trp Ala Asp  
 1635 1640 1645  
 Asn Asn Cys Tyr Leu Ser Ser Val Leu Leu Ala Leu Gln Gln Leu Glu  
 1650 1655 1660  
 Val Lys Phe Asn Ala Pro Ala Leu Gln Glu Ala Tyr Tyr Arg Ala Arg  
 1665 1670 1675 1680  
 Ala Gly Asp Ala Ala Asn Phe Cys Ala Leu Ile Leu Ala Tyr Ser Asn  
 1685 1690 1695  
 Lys Thr Val Gly Glu Leu Gly Asp Val Arg Glu Thr Met Thr His Leu  
 1700 1705 1710  
 Leu Gln His Ala Asn Leu Glu Ser Ala Lys Arg Val Leu Asn Val Val  
 1715 1720 1725  
 Cys Lys His Cys Gly Gln Lys Thr Thr Thr Leu Thr Gly Val Glu Ala  
 1730 1735 1740  
 Val Met Tyr Met Gly Thr Leu Ser Tyr Asp Asn Leu Lys Thr Gly Val  
 1745 1750 1755 1760  
 Ser Ile Pro Cys Val Cys Gly Arg Asp Ala Thr Gln Tyr Leu Val Gln  
 1765 1770 1775  
 Gln Glu Ser Ser Phe Val Met Met Ser Ala Pro Pro Ala Glu Tyr Lys  
 1780 1785 1790

SEQLIST-20480.TXT

Leu Gln Gln Gly Thr Phe Leu Cys Ala Asn Glu Tyr Thr Gly Asn Tyr  
 1795 1800 1805  
 Gln Cys Gly His Tyr Thr His Ile Thr Ala Lys Glu Thr Leu Tyr Arg  
 1810 1815 1820  
 Ile Asp Gly Ala His Leu Thr Lys Met Ser Glu Tyr Lys Gly Pro Val  
 1825 1830 1835 1840  
 Thr Asp Val Phe Tyr Lys Glu Thr Ser Tyr Thr Thr Thr Ile Lys Pro  
 1845 1850 1855  
 Val Ser Tyr Lys Leu Asp Gly Val Thr Tyr Thr Glu Ile Glu Pro Lys  
 1860 1865 1870  
 Leu Asp Gly Tyr Tyr Lys Lys Asp Asn Ala Tyr Tyr Thr Glu Gln Pro  
 1875 1880 1885  
 Ile Asp Leu Val Pro Thr Gln Pro Leu Pro Asn Ala Ser Phe Asp Asn  
 1890 1895 1900  
 Phe Lys Leu Thr Cys Ser Asn Thr Lys Phe Ala Asp Asp Leu Asn Gln  
 1905 1910 1915 1920  
 Met Thr Gly Phe Thr Lys Pro Ala Ser Arg Glu Leu Ser Val Thr Phe  
 1925 1930 1935  
 Phe Pro Asp Leu Asn Gly Asp Val Val Ala Ile Asp Tyr Arg His Tyr  
 1940 1945 1950  
 Ser Ala Ser Phe Lys Lys Gly Ala Lys Leu Leu His Lys Pro Ile Val  
 1955 1960 1965  
 Trp His Ile Asn Gln Ala Thr Thr Lys Thr Thr Phe Lys Pro Asn Thr  
 1970 1975 1980  
 Trp Cys Leu Arg Cys Leu Trp Ser Thr Lys Pro Val Asp Thr Ser Asn  
 1985 1990 1995 2000  
 Ser Phe Glu Val Leu Ala Val Glu Asp Thr Gln Gly Met Asp Asn Leu  
 2005 2010 2015  
 Ala Cys Glu Ser Gln Gln Pro Thr Ser Glu Glu Val Val Glu Asn Pro  
 2020 2025 2030  
 Thr Ile Gln Lys Glu Val Ile Glu Cys Asp Val Lys Thr Thr Glu Val  
 2035 2040 2045  
 Val Gly Asn Val Ile Leu Lys Pro Ser Asp Glu Gly Val Lys Val Thr  
 2050 2055 2060  
 Gln Glu Leu Gly His Glu Asp Leu Met Ala Ala Tyr Val Glu Asn Thr  
 2065 2070 2075 2080  
 Ser Ile Thr Ile Lys Lys Pro Asn Glu Leu Ser Leu Ala Leu Gly Leu  
 2085 2090 2095  
 Lys Thr Ile Ala Thr His Gly Ile Ala Ala Ile Asn Ser Val Pro Trp  
 2100 2105 2110  
 Ser Lys Ile Leu Ala Tyr Val Lys Pro Phe Leu Gly Gln Ala Ala Ile  
 2115 2120 2125

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Thr Thr Ser Asn Cys Ala Lys Arg Leu Ala Gln Arg Val Phe Asn Asn  
 2130 2135 2140  
 Tyr Met Pro Tyr Val Phe Thr Leu Leu Phe Gln Leu Cys Thr Phe Thr  
 2145 2150 2155 2160  
 Lys Ser Thr Asn Ser Arg Ile Arg Ala Ser Leu Pro Thr Thr Ile Ala  
 2165 2170 2175  
 Lys Asn Ser Val Lys Ser Val Ala Lys Leu Cys Leu Asp Ala Gly Ile  
 2180 2185 2190  
 Asn Tyr Val Lys Ser Pro Lys Phe Ser Lys Leu Phe Thr Ile Ala Met  
 2195 2200 2205  
 Trp Leu Leu Leu Leu Ser Ile Cys Leu Gly Ser Leu Ile Cys Val Thr  
 2210 2215 2220  
 Ala Ala Phe Gly Val Leu Leu Ser Asn Phe Gly Ala Pro Ser Tyr Cys  
 2225 2230 2235 2240  
 Asn Gly Val Arg Glu Leu Tyr Leu Asn Ser Ser Asn Val Thr Thr Met  
 2245 2250 2255  
 Asp Phe Cys Glu Gly Ser Phe Pro Cys Ser Ile Cys Leu Ser Gly Leu  
 2260 2265 2270  
 Asp Ser Leu Asp Ser Tyr Pro Ala Leu Glu Thr Ile Gln Val Thr Ile  
 2275 2280 2285  
 Ser Ser Tyr Lys Leu Asp Leu Thr Ile Leu Gly Leu Ala Ala Glu Trp  
 2290 2295 2300  
 Val Leu Ala Tyr Met Leu Phe Thr Lys Phe Phe Tyr Leu Leu Gly Leu  
 2305 2310 2315 2320  
 Ser Ala Ile Met Gln Val Phe Phe Gly Tyr Phe Ala Ser His Phe Ile  
 2325 2330 2335  
 Ser Asn Ser Trp Leu Met Trp Phe Ile Ile Ser Ile Val Gln Met Ala  
 2340 2345 2350  
 Pro Val Ser Ala Met Val Arg Met Tyr Ile Phe Phe Ala Ser Phe Tyr  
 2355 2360 2365  
 Tyr Ile Trp Lys Ser Tyr Val His Ile Met Asp Gly Cys Thr Ser Ser  
 2370 2375 2380  
 Thr Cys Met Met Cys Tyr Lys Arg Asn Arg Ala Thr Arg Val Glu Cys  
 2385 2390 2395 2400  
 Thr Thr Ile Val Asn Gly Met Lys Arg Ser Phe Tyr Val Tyr Ala Asn  
 2405 2410 2415  
 Gly Gly Arg Gly Phe Cys Lys Thr His Asn Trp Asn Cys Leu Asn Cys  
 2420 2425 2430  
 Asp Thr Phe Cys Thr Gly Ser Thr Phe Ile Ser Asp Glu Val Ala Arg  
 2435 2440 2445  
 Asp Leu Ser Leu Gln Phe Lys Arg Pro Ile Asn Pro Thr Asp Gln Ser  
 2450 2455 2460

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Ser Tyr Ile Val Asp Ser Val Ala Val Lys Asn Gly Ala Leu His Leu  
2465 2470 2475 2480  
Tyr Phe Asp Lys Ala Gly Gln Lys Thr Tyr Glu Arg His Pro Leu Ser  
2485 2490 2495  
His Phe Val Asn Leu Asp Asn Leu Arg Ala Asn Asn Thr Lys Gly Ser  
2500 2505 2510  
Leu Pro Ile Asn Val Ile Val Phe Asp Gly Lys Ser Lys Cys Asp Glu  
2515 2520 2525  
Ser Ala Ser Lys Ser Ala Ser Val Tyr Tyr Ser Gln Leu Met Cys Gln  
2530 2535 2540  
Pro Ile Leu Leu Leu Asp Gln Ala Leu Val Ser Asp Val Gly Asp Ser  
2545 2550 2555 2560  
Thr Glu Val Ser Val Lys Met Phe Asp Ala Tyr Val Asp Thr Phe Ser  
2565 2570 2575  
Ala Thr Phe Ser Val Pro Met Glu Lys Leu Lys Ala Leu Val Ala Thr  
2580 2585 2590  
Ala His Ser Glu Leu Ala Lys Gly Val Ala Leu Asp Gly Val Leu Ser  
2595 2600 2605  
Thr Phe Val Ser Ala Ala Arg Gln Gly Val Val Asp Thr Asp Val Asp  
2610 2615 2620  
Thr Lys Asp Val Ile Glu Cys Leu Lys Leu Ser His His Ser Asp Leu  
2625 2630 2635 2640  
Glu Val Thr Gly Asp Ser Cys Asn Asn Phe Met Leu Thr Tyr Asn Lys  
2645 2650 2655  
Val Glu Asn Met Thr Pro Arg Asp Leu Gly Ala Cys Ile Asp Cys Asn  
2660 2665 2670  
Ala Arg His Ile Asn Ala Gln Val Ala Lys Ser His Asn Val Ser Leu  
2675 2680 2685  
Ile Trp Asn Val Lys Asp Tyr Met Ser Leu Ser Glu Gln Leu Arg Lys  
2690 2695 2700  
Gln Ile Arg Ser Ala Ala Lys Lys Asn Asn Ile Pro Phe Arg Leu Thr  
2705 2710 2715 2720  
Cys Ala Thr Thr Arg Gln Val Val Asn Val Ile Thr Thr Lys Ile Ser  
2725 2730 2735  
Leu Lys Gly Gly Lys Ile Val Ser Thr Cys Phe Lys Leu Met Leu Lys  
2740 2745 2750  
Ala Thr Leu Leu Cys Val Leu Ala Ala Leu Val Cys Tyr Ile Val Met  
2755 2760 2765  
Pro Val His Thr Leu Ser Ile His Asp Gly Tyr Thr Asn Glu Ile Ile  
2770 2775 2780  
Gly Tyr Lys Ala Ile Gln Asp Gly Val Thr Arg Asp Ile Ile Ser Thr  
2785 2790 2795 2800

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Asp Asp Cys Phe Ala Asn Lys His Ala Gly Phe Asp Ala Trp Phe Ser  
 2805 2810 2815  
 Gln Arg Gly Gly Ser Tyr Lys Asn Asp Lys Ser Cys Pro Val Val Ala  
 2820 2825 2830  
 Ala Ile Ile Thr Arg Glu Ile Gly Phe Ile Val Pro Gly Leu Pro Gly  
 2835 2840 2845  
 Thr Val Leu Arg Ala Ile Asn Gly Asp Phe Leu His Phe Leu Pro Arg  
 2850 2855 2860  
 Val Phe Ser Ala Val Gly Asn Ile Cys Tyr Thr Pro Ser Lys Leu Ile  
 2865 2870 2875 2880  
 Glu Tyr Ser Asp Phe Ala Thr Ser Ala Cys Val Leu Ala Ala Glu Cys  
 2885 2890 2895  
 Thr Ile Phe Lys Asp Ala Met Gly Lys Pro Val Pro Tyr Cys Tyr Asp  
 2900 2905 2910  
 Thr Asn Leu Leu Glu Gly Ser Ile Ser Tyr Ser Glu Leu Arg Pro Asp  
 2915 2920 2925  
 Thr Arg Tyr Val Leu Met Asp Gly Ser Ile Ile Gln Phe Pro Asn Thr  
 2930 2935 2940  
 Tyr Leu Glu Gly Ser Val Arg Val Val Thr Thr Phe Asp Ala Glu Tyr  
 2945 2950 2955 2960  
 Cys Arg His Gly Thr Cys Glu Arg Ser Glu Val Gly Ile Cys Leu Ser  
 2965 2970 2975  
 Thr Ser Gly Arg Trp Val Leu Asn Asn Glu His Tyr Arg Ala Leu Ser  
 2980 2985 2990  
 Gly Val Phe Cys Gly Val Asp Ala Met Asn Leu Ile Ala Asn Ile Phe  
 2995 3000 3005  
 Thr Pro Leu Val Gln Pro Val Gly Ala Leu Asp Val Ser Ala Ser Val  
 3010 3015 3020  
 Val Ala Gly Gly Ile Ile Ala Ile Leu Val Thr Cys Ala Ala Tyr Tyr  
 3025 3030 3035 3040  
 Phe Met Lys Phe Arg Arg Val Phe Gly Glu Tyr Asn His Val Val Ala  
 3045 3050 3055  
 Ala Asn Ala Leu Leu Phe Leu Met Ser Phe Thr Ile Leu Cys Leu Val  
 3060 3065 3070  
 Pro Ala Tyr Ser Phe Leu Pro Gly Val Tyr Ser Val Phe Tyr Leu Tyr  
 3075 3080 3085  
 Leu Thr Phe Tyr Phe Thr Asn Asp Val Ser Phe Leu Ala His Leu Gln  
 3090 3095 3100  
 Trp Phe Ala Met Phe Ser Pro Ile Val Pro Phe Trp Ile Thr Ala Ile  
 3105 3110 3115 3120  
 Tyr Val Phe Cys Ile Ser Leu Lys His Cys His Trp Phe Phe Asn Asn  
 3125 3130 3135

SEQLIST-20480.TXT

Tyr Leu Arg Lys Arg Val Met Phe Asn Gly Val Thr Phe Ser Thr Phe  
 3140 3145 3150  
 Glu Glu Ala Ala Leu Cys Thr Phe Leu Leu Asn Lys Glu Met Tyr Leu  
 3155 3160 3165  
 Lys Leu Arg Ser Glu Thr Leu Leu Pro Leu Thr Gln Tyr Asn Arg Tyr  
 3170 3175 3180  
 Leu Ala Leu Tyr Asn Lys Tyr Lys Tyr Phe Ser Gly Ala Leu Asp Thr  
 3185 3190 3195 3200  
 Thr Ser Tyr Arg Glu Ala Ala Cys Cys His Leu Ala Lys Ala Leu Asn  
 3205 3210 3215  
 Asp Phe Ser Asn Ser Gly Ala Asp Val Leu Tyr Gln Pro Pro Gln Thr  
 3220 3225 3230  
 Ser Ile Thr Ser Ala Val Leu Gln Ser Gly Phe Arg Lys Met Ala Phe  
 3235 3240 3245  
 Pro Ser Gly Lys Val Glu Gly Cys Met Val Gln Val Thr Cys Gly Thr  
 3250 3255 3260  
 Thr Thr Leu Asn Gly Leu Trp Leu Asp Asp Thr Val Tyr Cys Pro Arg  
 3265 3270 3275 3280  
 His Val Ile Cys Thr Ala Glu Asp Met Leu Asn Pro Asn Tyr Glu Asp  
 3285 3290 3295  
 Leu Leu Ile Arg Lys Ser Asn His Ser Phe Leu Val Gln Ala Gly Asn  
 3300 3305 3310  
 Val Gln Leu Arg Val Ile Gly His Ser Met Gln Asn Cys Leu Leu Arg  
 3315 3320 3325  
 Leu Lys Val Asp Thr Ser Asn Pro Lys Thr Pro Lys Tyr Lys Phe Val  
 3330 3335 3340  
 Arg Ile Gln Pro Gly Gln Thr Phe Ser Val Leu Ala Cys Tyr Asn Gly  
 3345 3350 3355 3360  
 Ser Pro Ser Gly Val Tyr Gln Cys Ala Met Arg Pro Asn His Thr Ile  
 3365 3370 3375  
 Lys Gly Ser Phe Leu Asn Gly Ser Cys Gly Ser Val Gly Phe Asn Ile  
 3380 3385 3390  
 Asp Tyr Asp Cys Val Ser Phe Cys Tyr Met His His Met Glu Leu Pro  
 3395 3400 3405  
 Thr Gly Val His Ala Gly Thr Asp Leu Glu Gly Lys Phe Tyr Gly Pro  
 3410 3415 3420  
 Phe Val Asp Arg Gln Thr Ala Gln Ala Ala Gly Thr Asp Thr Thr Ile  
 3425 3430 3435 3440  
 Thr Leu Asn Val Leu Ala Trp Leu Tyr Ala Ala Val Ile Asn Gly Asp  
 3445 3450 3455  
 Arg Trp Phe Leu Asn Arg Phe Thr Thr Thr Leu Asn Asp Phe Asn Leu  
 3460 3465 3470

SEQLIST-20480.TXT

Val Ala Met Lys Tyr Asn Tyr Glu Pro Leu Thr Gln Asp His Val Asp  
3475 3480 3485

Ile Leu Gly Pro Leu Ser Ala Gln Thr Gly Ile Ala Val Leu Asp Met  
3490 3495 3500

Cys Ala Ala Leu Lys Glu Leu Leu Gln Asn Gly Met Asn Gly Arg Thr  
3505 3510 3515 3520

Ile Leu Gly Ser Thr Ile Leu Glu Asp Glu Phe Thr Pro Phe Asp Val  
3525 3530 3535

Val Arg Gln Cys Ser Gly Val Thr Phe Gln Gly Lys Phe Lys Lys Ile  
3540 3545 3550

Val Lys Gly Thr His His Trp Met Leu Leu Thr Phe Leu Thr Ser Leu  
3555 3560 3565

Leu Ile Leu Val Gln Ser Thr Gln Trp Ser Leu Phe Phe Phe Val Tyr  
3570 3575 3580

Glu Asn Ala Phe Leu Pro Phe Thr Leu Gly Ile Met Ala Ile Ala Ala  
3585 3590 3595 3600

Cys Ala Met Leu Leu Val Lys His Lys His Ala Phe Leu Cys Leu Phe  
3605 3610 3615

Leu Leu Pro Ser Leu Ala Thr Val Ala Tyr Phe Asn Met Val Tyr Met  
3620 3625 3630

Pro Ala Ser Trp Val Met Arg Ile Met Thr Trp Leu Glu Leu Ala Asp  
3635 3640 3645

Thr Ser Leu Ser Gly Tyr Arg Leu Lys Asp Cys Val Met Tyr Ala Ser  
3650 3655 3660

Ala Leu Val Leu Leu Ile Leu Met Thr Ala Arg Thr Val Tyr Asp Asp  
3665 3670 3675 3680

Ala Ala Arg Arg Val Trp Thr Leu Met Asn Val Ile Thr Leu Val Tyr  
3685 3690 3695

Lys Val Tyr Tyr Gly Asn Ala Leu Asp Gln Ala Ile Ser Met Trp Ala  
3700 3705 3710

Leu Val Ile Ser Val Thr Ser Asn Tyr Ser Gly Val Val Thr Thr Ile  
3715 3720 3725

Met Phe Leu Ala Arg Ala Ile Val Phe Val Cys Val Glu Tyr Tyr Pro  
3730 3735 3740

Leu Leu Phe Ile Thr Gly Asn Thr Leu Gln Cys Ile Met Leu Val Tyr  
3745 3750 3755 3760

Cys Phe Leu Gly Tyr Cys Cys Cys Cys Tyr Phe Gly Leu Phe Cys Leu  
3765 3770 3775

Leu Asn Arg Tyr Phe Arg Leu Thr Leu Gly Val Tyr Asp Tyr Leu Val  
3780 3785 3790

Ser Thr Gln Glu Phe Arg Tyr Met Asn Ser Gln Gly Leu Leu Pro Pro  
3795 3800 3805



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Lys Ser Ser Ile Asp Ala Phe Lys Leu Asn Ile Lys Leu Leu Gly Ile  
 3810 3815 3820  
 Gly Gly Lys Pro Cys Ile Lys Val Ala Thr Val Gln Ser Lys Met Ser  
 3825 3830 3835 3840  
 Asp Val Lys Cys Thr Ser Val Val Leu Leu Ser Val Leu Gln Gln Leu  
 3845 3850 3855  
 Arg Val Glu Ser Ser Ser Lys Leu Trp Ala Gln Cys Val Gln Leu His  
 3860 3865 3870  
 Asn Asp Ile Leu Leu Ala Lys Asp Thr Thr Glu Ala Phe Glu Lys Met  
 3875 3880 3885  
 Val Ser Leu Leu Ser Val Leu Leu Ser Met Gln Gly Ala Val Asp Ile  
 3890 3895 3900  
 Asn Arg Leu Cys Glu Glu Met Leu Asp Asn Arg Ala Thr Leu Gln Ala  
 3905 3910 3915 3920  
 Ile Ala Ser Glu Phe Ser Ser Leu Pro Ser Tyr Ala Ala Tyr Ala Thr  
 3925 3930 3935  
 Ala Gln Glu Ala Tyr Glu Gln Ala Val Ala Asn Gly Asp Ser Glu Val  
 3940 3945 3950  
 Val Leu Lys Lys Leu Lys Lys Ser Leu Asn Val Ala Lys Ser Glu Phe  
 3955 3960 3965  
 Asp Arg Asp Ala Ala Met Gln Arg Lys Leu Glu Lys Met Ala Asp Gln  
 3970 3975 3980  
 Ala Met Thr Gln Met Tyr Lys Gln Ala Arg Ser Glu Asp Lys Arg Ala  
 3985 3990 3995 4000  
 Lys Val Thr Ser Ala Met Gln Thr Met Leu Phe Thr Met Leu Arg Lys  
 4005 4010 4015  
 Leu Asp Asn Asp Ala Leu Asn Asn Ile Ile Asn Asn Ala Arg Asp Gly  
 4020 4025 4030  
 Cys Val Pro Leu Asn Ile Ile Pro Leu Thr Thr Ala Ala Lys Leu Met  
 4035 4040 4045  
 Val Val Val Pro Asp Tyr Gly Thr Tyr Lys Asn Thr Cys Asp Gly Asn  
 4050 4055 4060  
 Thr Phe Thr Tyr Ala Ser Ala Leu Trp Glu Ile Gln Gln Val Val Asp  
 4065 4070 4075 4080  
 Ala Asp Ser Lys Ile Val Gln Leu Ser Glu Ile Asn Met Asp Asn Ser  
 4085 4090 4095  
 Pro Asn Leu Ala Trp Pro Leu Ile Val Thr Ala Leu Arg Ala Asn Ser  
 4100 4105 4110  
 Ala Val Lys Leu Gln Asn Asn Glu Leu Ser Pro Val Ala Leu Arg Gln  
 4115 4120 4125  
 Met Ser Cys Ala Ala Gly Thr Thr Gln Thr Ala Cys Thr Asp Asp Asn  
 4130 4135 4140

SEQLIST-20480.TXT

Ala Leu Ala Tyr Tyr Asn Asn Ser Lys Gly Gly Arg Phe Val Leu Ala  
4145 4150 4155 4160

Leu Leu Ser Asp His Gln Asp Leu Lys Trp Ala Arg Phe Pro Lys Ser  
4165 4170 4175

Asp Gly Thr Gly Thr Ile Tyr Thr Glu Leu Glu Pro Pro Cys Arg Phe  
4180 4185 4190

Val Thr Asp Thr Pro Lys Gly Pro Lys Val Lys Tyr Leu Tyr Phe Ile  
4195 4200 4205

Lys Gly Leu Asn Asn Leu Asn Arg Gly Met Val Leu Gly Ser Leu Ala  
4210 4215 4220

Ala Thr Val Arg Leu Gln Ala Gly Asn Ala Thr Glu Val Pro Ala Asn  
4225 4230 4235 4240

Ser Thr Val Leu Ser Phe Cys Ala Phe Ala Val Asp Pro Ala Lys Ala  
4245 4250 4255

Tyr Lys Asp Tyr Leu Ala Ser Gly Gly Gln Pro Ile Thr Asn Cys Val  
4260 4265 4270

Lys Met Leu Cys Thr His Thr Gly Thr Gly Gln Ala Ile Thr Val Thr  
4275 4280 4285

Pro Glu Ala Asn Met Asp Gln Glu Ser Phe Gly Gly Ala Ser Cys Cys  
4290 4295 4300

Leu Tyr Cys Arg Cys His Ile Asp His Pro Asn Pro Lys Gly Phe Cys  
4305 4310 4315 4320

Asp Leu Lys Gly Lys Tyr Val Gln Ile Pro Thr Thr Cys Ala Asn Asp  
4325 4330 4335

Pro Val Gly Phe Thr Leu Arg Asn Thr Val Cys Thr Val Cys Gly Met  
4340 4345 4350

Trp Lys Gly Tyr Gly Cys Ser Cys Asp Gln Leu Arg Glu Pro Leu Met  
4355 4360 4365

Gln Ser Ala Asp Ala Ser Thr Phe Leu Asn Arg Val Cys Gly Val Ser  
4370 4375 4380

Ala Ala Arg Leu Thr Pro Cys Gly Thr Gly Thr Ser Thr Asp Val Val  
4385 4390 4395 4400

Tyr Arg Ala Phe Asp Ile Tyr Asn Glu Lys Val Ala Gly Phe Ala Lys  
4405 4410 4415

Phe Leu Lys Thr Asn Cys Cys Arg Phe Gln Glu Lys Asp Glu Glu Gly  
4420 4425 4430

Asn Leu Leu Asp Ser Tyr Phe Val Val Lys Arg His Thr Met Ser Asn  
4435 4440 4445

Tyr Gln His Glu Glu Thr Ile Tyr Asn Leu Val Lys Asp Cys Pro Ala  
4450 4455 4460

Val Ala Val His Asp Phe Phe Lys Phe Arg Val Asp Gly Asp Met Val  
4465 4470 4475 4480

SEQLIST-20480.TXT

Pro His Ile Ser Arg Gln Arg Leu Thr Lys Tyr Thr Met Ala Asp Leu  
4485 4490 4495

Val Tyr Ala Leu Arg His Phe Asp Glu Gly Asn Cys Asp Thr Leu Lys  
4500 4505 4510

Glu Ile Leu Val Thr Tyr Asn Cys Cys Asp Asp Asp Tyr Phe Asn Lys  
4515 4520 4525

Lys Asp Trp Tyr Asp Phe Val Glu Asn Pro Asp Ile Leu Arg Val Tyr  
4530 4535 4540

Ala Asn Leu Gly Glu Arg Val Arg Gln Ser Leu Leu Lys Thr Val Gln  
4545 4550 4555 4560

Phe Cys Asp Ala Met Arg Asp Ala Gly Ile Val Gly Val Leu Thr Leu  
4565 4570 4575

Asp Asn Gln Asp Leu Asn Gly Asn Trp Tyr Asp Phe Gly Asp Phe Val  
4580 4585 4590

Gln Val Ala Pro Gly Cys Gly Val Pro Ile Val Asp Ser Tyr Tyr Ser  
4595 4600 4605

Leu Leu Met Pro Ile Leu Thr Leu Thr Arg Ala Leu Ala Ala Glu Ser  
4610 4615 4620

His Met Asp Ala Asp Leu Ala Lys Pro Leu Ile Lys Trp Asp Leu Leu  
4625 4630 4635 4640

Lys Tyr Asp Phe Thr Glu Glu Arg Leu Cys Leu Phe Asp Arg Tyr Phe  
4645 4650 4655

Lys Tyr Trp Asp Gln Thr Tyr His Pro Asn Cys Ile Asn Cys Leu Asp  
4660 4665 4670

Asp Arg Cys Ile Leu His Cys Ala Asn Phe Asn Val Leu Phe Ser Thr  
4675 4680 4685

Val Phe Pro Pro Thr Ser Phe Gly Pro Leu Val Arg Lys Ile Phe Val  
4690 4695 4700

Asp Gly Val Pro Phe Val Val Ser Thr Gly Tyr His Phe Arg Glu Leu  
4705 4710 4715 4720

Gly Val Val His Asn Gln Asp Val Asn Leu His Ser Ser Arg Leu Ser  
4725 4730 4735

Phe Lys Glu Leu Leu Val Tyr Ala Ala Asp Pro Ala Met His Ala Ala  
4740 4745 4750

Ser Gly Asn Leu Leu Leu Asp Lys Arg Thr Thr Cys Phe Ser Val Ala  
4755 4760 4765

Ala Leu Thr Asn Asn Val Ala Phe Gln Thr Val Lys Pro Gly Asn Phe  
4770 4775 4780

Asn Lys Asp Phe Tyr Asp Phe Ala Val Ser Lys Gly Phe Phe Lys Glu  
4785 4790 4795 4800

Gly Ser Ser Val Glu Leu Lys His Phe Phe Phe Ala Gln Asp Gly Asn  
4805 4810 4815

SEQLIST-20480.TXT

Ala Ala Ile Ser Asp Tyr Asp Tyr Tyr Arg Tyr Asn Leu Pro Thr Met  
4820 4825 4830

Cys Asp Ile Arg Gln Leu Leu Phe Val Val Glu Val Val Asp Lys Tyr  
4835 4840 4845

Phe Asp Cys Tyr Asp Gly Gly Cys Ile Asn Ala Asn Gln Val Ile Val  
4850 4855 4860

Asn Asn Leu Asp Lys Ser Ala Gly Phe Pro Phe Asn Lys Trp Gly Lys  
4865 4870 4875 4880

Ala Arg Leu Tyr Tyr Asp Ser Met Ser Tyr Glu Asp Gln Asp Ala Leu  
4885 4890 4895

Phe Ala Tyr Thr Lys Arg Asn Val Ile Pro Thr Ile Thr Gln Met Asn  
4900 4905 4910

Leu Lys Tyr Ala Ile Ser Ala Lys Asn Arg Ala Arg Thr Val Ala Gly  
4915 4920 4925

Val Ser Ile Cys Ser Thr Met Thr Asn Arg Gln Phe His Gln Lys Leu  
4930 4935 4940

Leu Lys Ser Ile Ala Ala Thr Arg Gly Ala Thr Val Val Ile Gly Thr  
4945 4950 4955 4960

Ser Lys Phe Tyr Gly Gly Trp His Asn Met Leu Lys Thr Val Tyr Ser  
4965 4970 4975

Asp Val Glu Thr Pro His Leu Met Gly Trp Asp Tyr Pro Lys Cys Asp  
4980 4985 4990

Arg Ala Met Pro Asn Met Leu Arg Ile Met Ala Ser Leu Val Leu Ala  
4995 5000 5005

Arg Lys His Asn Thr Cys Cys Asn Leu Ser His Arg Phe Tyr Arg Leu  
5010 5015 5020

Ala Asn Glu Cys Ala Gln Val Leu Ser Glu Met Val Met Cys Gly Gly  
5025 5030 5035 5040

Ser Leu Tyr Val Lys Pro Gly Gly Thr Ser Ser Gly Asp Ala Thr Thr  
5045 5050 5055

Ala Tyr Ala Asn Ser Val Phe Asn Ile Cys Gln Ala Val Thr Ala Asn  
5060 5065 5070

Val Asn Ala Leu Leu Ser Thr Asp Gly Asn Lys Ile Ala Asp Lys Tyr  
5075 5080 5085

Val Arg Asn Leu Gln His Arg Leu Tyr Glu Cys Leu Tyr Arg Asn Arg  
5090 5095 5100

Asp Val Asp His Glu Phe Val Asp Glu Phe Tyr Ala Tyr Leu Arg Lys  
5105 5110 5115 5120

His Phe Ser Met Met Ile Leu Ser Asp Asp Ala Val Val Cys Tyr Asn  
5125 5130 5135

Ser Asn Tyr Ala Ala Gln Gly Leu Val Ala Ser Ile Lys Asn Phe Lys  
5140 5145 5150

SEQLIST-20480.TXT

Ala Val Leu Tyr Tyr Gln Asn Asn Val Phe Met Ser Glu Ala Lys Cys  
5155 5160 5165

Trp Thr Glu Thr Asp Leu Thr Lys Gly Pro His Glu Phe Cys Ser Gln  
5170 5175 5180

His Thr Met Leu Val Lys Gln Gly Asp Asp Tyr Val Tyr Leu Pro Tyr  
5185 5190 5195 5200

Pro Asp Pro Ser Arg Ile Leu Gly Ala Gly Cys Phe Val Asp Asp Ile  
5205 5210 5215

Val Lys Thr Asp Gly Thr Leu Met Ile Glu Arg Phe Val Ser Leu Ala  
5220 5225 5230

Ile Asp Ala Tyr Pro Leu Thr Lys His Pro Asn Gln Glu Tyr Ala Asp  
5235 5240 5245

Val Phe His Leu Tyr Leu Gln Tyr Ile Arg Lys Leu His Asp Glu Leu  
5250 5255 5260

Thr Gly His Met Leu Asp Met Tyr Ser Val Met Leu Thr Asn Asp Asn  
5265 5270 5275 5280

Thr Ser Arg Tyr Trp Glu Pro Glu Phe Tyr Glu Ala Met Tyr Thr Pro  
5285 5290 5295

His Thr Val Leu Gln Ala Val Gly Ala Cys Val Leu Cys Asn Ser Gln  
5300 5305 5310

Thr Ser Leu Arg Cys Gly Ala Cys Ile Arg Arg Pro Phe Leu Cys Cys  
5315 5320 5325

Lys Cys Cys Tyr Asp His Val Ile Ser Thr Ser His Lys Leu Val Leu  
5330 5335 5340

Ser Val Asn Pro Tyr Val Cys Asn Ala Pro Gly Cys Asp Val Thr Asp  
5345 5350 5355 5360

Val Thr Gln Leu Tyr Leu Gly Gly Met Ser Tyr Tyr Cys Lys Ser His  
5365 5370 5375

Lys Pro Pro Ile Ser Phe Pro Leu Cys Ala Asn Gly Gln Val Phe Gly  
5380 5385 5390

Leu Tyr Lys Asn Thr Cys Val Gly Ser Asp Asn Val Thr Asp Phe Asn  
5395 5400 5405

Ala Ile Ala Thr Cys Asp Trp Thr Asn Ala Gly Asp Tyr Ile Leu Ala  
5410 5415 5420

Asn Thr Cys Thr Glu Arg Leu Lys Leu Phe Ala Ala Glu Thr Leu Lys  
5425 5430 5435 5440

Ala Thr Glu Glu Thr Phe Lys Leu Ser Tyr Gly Ile Ala Thr Val Arg  
5445 5450 5455

Glu Val Leu Ser Asp Arg Glu Leu His Leu Ser Trp Glu Val Gly Lys  
5460 5465 5470

Pro Arg Pro Pro Leu Asn Arg Asn Tyr Val Phe Thr Gly Tyr Arg Val  
5475 5480 5485

SEQLIST-20480.TXT

Thr Lys Asn Ser Lys Val Gln Ile Gly Glu Tyr Thr Phe Glu Lys Gly  
5490 5495 5500

Asp Tyr Gly Asp Ala Val Val Tyr Arg Gly Thr Thr Thr Tyr Lys Leu  
5505 5510 5515 5520

Asn Val Gly Asp Tyr Phe Val Leu Thr Ser His Thr Val Met Pro Leu  
5525 5530 5535

Ser Ala Pro Thr Leu Val Pro Gln Glu His Tyr Val Arg Ile Thr Gly  
5540 5545 5550

Leu Tyr Pro Thr Leu Asn Ile Ser Asp Glu Phe Ser Ser Asn Val Ala  
5555 5560 5565

Asn Tyr Gln Lys Val Gly Met Gln Lys Tyr Ser Thr Leu Gln Gly Pro  
5570 5575 5580

Pro Gly Thr Gly Lys Ser His Phe Ala Ile Gly Leu Ala Leu Tyr Tyr  
5585 5590 5595 5600

Pro Ser Ala Arg Ile Val Tyr Thr Ala Cys Ser His Ala Ala Val Asp  
5605 5610 5615

Ala Leu Cys Glu Lys Ala Leu Lys Tyr Leu Pro Ile Asp Lys Cys Ser  
5620 5625 5630

Arg Ile Ile Pro Ala Arg Ala Arg Val Glu Cys Phe Asp Lys Phe Lys  
5635 5640 5645

Val Asn Ser Thr Leu Glu Gln Tyr Val Phe Cys Thr Val Asn Ala Leu  
5650 5655 5660

Pro Glu Thr Thr Ala Asp Ile Val Val Phe Asp Glu Ile Ser Met Ala  
5665 5670 5675 5680

Thr Asn Tyr Asp Leu Ser Val Val Asn Ala Arg Leu Arg Ala Lys His  
5685 5690 5695

Tyr Val Tyr Ile Gly Asp Pro Ala Gln Leu Pro Ala Pro Arg Thr Leu  
5700 5705 5710

Leu Thr Lys Gly Thr Leu Glu Pro Glu Tyr Phe Asn Ser Val Cys Arg  
5715 5720 5725

Leu Met Lys Thr Ile Gly Pro Asp Met Phe Leu Gly Thr Cys Arg Arg  
5730 5735 5740

Cys Pro Ala Glu Ile Val Asp Thr Val Ser Ala Leu Val Tyr Asp Asn  
5745 5750 5755 5760

Lys Leu Lys Ala His Lys Asp Lys Ser Ala Gln Cys Phe Lys Met Phe  
5765 5770 5775

Tyr Lys Gly Val Ile Thr His Asp Val Ser Ser Ala Ile Asn Arg Pro  
5780 5785 5790

Gln Ile Gly Val Val Arg Glu Phe Leu Thr Arg Asn Pro Ala Trp Arg  
5795 5800 5805

Lys Ala Val Phe Ile Ser Pro Tyr Asn Ser Gln Asn Ala Val Ala Ser  
5810 5815 5820

SEQLIST-20480.TXT

Lys Ile Leu Gly Leu Pro Thr Gln Thr Val Asp Ser Ser Gln Gly Ser  
 5825 5830 5835 5840  
 Glu Tyr Asp Tyr Val Ile Phe Thr Gln Thr Thr Glu Thr Ala His Ser  
 5845 5850 5855  
 Cys Asn Val Asn Arg Phe Asn Val Ala Ile Thr Arg Ala Lys Ile Gly  
 5860 5865 5870  
 Ile Leu Cys Ile Met Ser Asp Arg Asp Leu Tyr Asp Lys Leu Gln Phe  
 5875 5880 5885  
 Thr Ser Leu Glu Ile Pro Arg Arg Asn Val Ala Thr Leu Gln Ala Glu  
 5890 5895 5900  
 Asn Val Thr Gly Leu Phe Lys Asp Cys Ser Lys Ile Ile Thr Gly Leu  
 5905 5910 5915 5920  
 His Pro Thr Gln Ala Pro Thr His Leu Ser Val Asp Ile Lys Phe Lys  
 5925 5930 5935  
 Thr Glu Gly Leu Cys Val Asp Ile Pro Gly Ile Pro Lys Asp Met Thr  
 5940 5945 5950  
 Tyr Arg Arg Leu Ile Ser Met Met Gly Phe Lys Met Asn Tyr Gln Val  
 5955 5960 5965  
 Asn Gly Tyr Pro Asn Met Phe Ile Thr Arg Glu Glu Ala Ile Arg His  
 5970 5975 5980  
 Val Arg Ala Trp Ile Gly Phe Asp Val Glu Gly Cys His Ala Thr Arg  
 5985 5990 5995 6000  
 Asp Ala Val Gly Thr Asn Leu Pro Leu Gln Leu Gly Phe Ser Thr Gly  
 6005 6010 6015  
 Val Asn Leu Val Ala Val Pro Thr Gly Tyr Val Asp Thr Glu Asn Asn  
 6020 6025 6030  
 Thr Glu Phe Thr Arg Val Asn Ala Lys Pro Pro Pro Gly Asp Gln Phe  
 6035 6040 6045  
 Lys His Leu Ile Pro Leu Met Tyr Lys Gly Leu Pro Trp Asn Val Val  
 6050 6055 6060  
 Arg Ile Lys Ile Val Gln Met Leu Ser Asp Thr Leu Lys Gly Leu Ser  
 6065 6070 6075 6080  
 Asp Arg Val Val Phe Val Leu Trp Ala His Gly Phe Glu Leu Thr Ser  
 6085 6090 6095  
 Met Lys Tyr Phe Val Lys Ile Gly Pro Glu Arg Thr Cys Cys Leu Cys  
 6100 6105 6110  
 Asp Lys Arg Ala Thr Cys Phe Ser Thr Ser Ser Asp Thr Tyr Ala Cys  
 6115 6120 6125  
 Trp Asn His Ser Val Gly Phe Asp Tyr Val Tyr Asn Pro Phe Met Ile  
 6130 6135 6140  
 Asp Val Gln Gln Trp Gly Phe Thr Gly Asn Leu Gln Ser Asn His Asp  
 6145 6150 6155 6160

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Gln His Cys Gln Val His Gly Asn Ala His Val Ala Ser Cys Asp Ala  
6165 6170 6175

Ile Met Thr Arg Cys Leu Ala Val His Glu Cys Phe Val Lys Arg Val  
6180 6185 6190

Asp Trp Ser Val Glu Tyr Pro Ile Ile Gly Asp Glu Leu Arg Val Asn  
6195 6200 6205

Ser Ala Cys Arg Lys Val Gln His Met Val Val Lys Ser Ala Leu Leu  
6210 6215 6220

Ala Asp Lys Phe Pro Val Leu His Asp Ile Gly Asn Pro Lys Ala Ile  
6225 6230 6235 6240

Lys Cys Val Pro Gln Ala Glu Val Glu Trp Lys Phe Tyr Asp Ala Gln  
6245 6250 6255

Pro Cys Ser Asp Lys Ala Tyr Lys Ile Glu Glu Leu Phe Tyr Ser Tyr  
6260 6265 6270

Ala Ile His His Asp Lys Phe Thr Asp Gly Val Cys Leu Phe Trp Asn  
6275 6280 6285

Cys Asn Val Asp Arg Tyr Pro Ala Asn Ala Ile Val Cys Arg Phe Asp  
6290 6295 6300

Thr Arg Val Leu Ser Asn Leu Asn Leu Pro Gly Cys Asp Gly Gly Ser  
6305 6310 6315 6320

Leu Tyr Val Asn Lys His Ala Phe His Thr Pro Ala Phe Asp Lys Ser  
6325 6330 6335

Ala Phe Thr Asn Leu Lys Gln Leu Pro Phe Phe Tyr Tyr Ser Asp Ser  
6340 6345 6350

Pro Cys Glu Ser His Gly Lys Gln Val Val Ser Asp Ile Asp Tyr Val  
6355 6360 6365

Pro Leu Lys Ser Ala Thr Cys Ile Thr Arg Cys Asn Leu Gly Gly Ala  
6370 6375 6380

Val Cys Arg His His Ala Asn Glu Tyr Arg Gln Tyr Leu Asp Ala Tyr  
6385 6390 6395 6400

Asn Met Met Ile Ser Ala Gly Phe Ser Leu Trp Ile Tyr Lys Gln Phe  
6405 6410 6415

Asp Thr Tyr Asn Leu Trp Asn Thr Phe Thr Arg Leu Gln Ser Leu Glu  
6420 6425 6430

Asn Val Ala Tyr Asn Val Val Asn Lys Gly His Phe Asp Gly His Ala  
6435 6440 6445

Gly Glu Ala Pro Val Ser Ile Ile Asn Asn Ala Val Tyr Thr Lys Val  
6450 6455 6460

Asp Gly Ile Asp Val Glu Ile Phe Glu Asn Lys Thr Thr Leu Pro Val  
6465 6470 6475 6480

Asn Val Ala Phe Glu Leu Trp Ala Lys Arg Asn Ile Lys Pro Val Pro  
6485 6490 6495



SEQLIST-20480.TXT

Glu Ile Lys Ile Leu Asn Asn Leu Gly Val Asp Ile Ala Ala Asn Thr  
 6500 6505 6510  
 Val Ile Trp Asp Tyr Lys Arg Glu Ala Pro Ala His Val Ser Thr Ile  
 6515 6520 6525  
 Gly Val Cys Thr Met Thr Asp Ile Ala Lys Lys Pro Thr Glu Ser Ala  
 6530 6535 6540  
 Cys Ser Ser Leu Thr Val Leu Phe Asp Gly Arg Val Glu Gly Gln Val  
 6545 6550 6555 6560  
 Asp Leu Phe Arg Asn Ala Arg Asn Gly Val Leu Ile Thr Glu Gly Ser  
 6565 6570 6575  
 Val Lys Gly Leu Thr Pro Ser Lys Gly Pro Ala Gln Ala Ser Val Asn  
 6580 6585 6590  
 Gly Val Thr Leu Ile Gly Glu Ser Val Lys Thr Gln Phe Asn Tyr Phe  
 6595 6600 6605  
 Lys Lys Val Asp Gly Ile Ile Gln Gln Leu Pro Glu Thr Tyr Phe Thr  
 6610 6615 6620  
 Gln Ser Arg Asp Leu Glu Asp Phe Lys Pro Arg Ser Gln Met Glu Thr  
 6625 6630 6635 6640  
 Asp Phe Leu Glu Leu Ala Met Asp Glu Phe Ile Gln Arg Tyr Lys Leu  
 6645 6650 6655  
 Glu Gly Tyr Ala Phe Glu His Ile Val Tyr Gly Asp Phe Ser His Gly  
 6660 6665 6670  
 Gln Leu Gly Gly Leu His Leu Met Ile Gly Leu Ala Lys Arg Ser Gln  
 6675 6680 6685  
 Asp Ser Pro Leu Lys Leu Glu Asp Phe Ile Pro Met Asp Ser Thr Val  
 6690 6695 6700  
 Lys Asn Tyr Phe Ile Thr Asp Ala Gln Thr Gly Ser Ser Lys Cys Val  
 6705 6710 6715 6720  
 Cys Ser Val Ile Asp Leu Leu Leu Asp Asp Phe Val Glu Ile Ile Lys  
 6725 6730 6735  
 Ser Gln Asp Leu Ser Val Ile Ser Lys Val Val Lys Val Thr Ile Asp  
 6740 6745 6750  
 Tyr Ala Glu Ile Ser Phe Met Leu Trp Cys Lys Asp Gly His Val Glu  
 6755 6760 6765  
 Thr Phe Tyr Pro Lys Leu Gln Ala Ser Gln Ala Trp Gln Pro Gly Val  
 6770 6775 6780  
 Ala Met Pro Asn Leu Tyr Lys Met Gln Arg Met Leu Leu Glu Lys Cys  
 6785 6790 6795 6800  
 Asp Leu Gln Asn Tyr Gly Glu Asn Ala Val Ile Pro Lys Gly Ile Met  
 6805 6810 6815  
 Met Asn Val Ala Lys Tyr Thr Gln Leu Cys Gln Tyr Leu Asn Thr Leu  
 6820 6825 6830

SEQLIST-20480.TXT

Thr Leu Ala Val Pro Tyr Asn Met Arg Val Ile His Phe Gly Ala Gly  
6835 6840 6845

Ser Asp Lys Gly Val Ala Pro Gly Thr Ala Val Leu Arg Gln Trp Leu  
6850 6855 6860

Pro Thr Gly Thr Leu Leu Val Asp Ser Asp Leu Asn Asp Phe Val Ser  
6865 6870 6875 6880

Asp Ala Asp Ser Thr Leu Ile Gly Asp Cys Ala Thr Val His Thr Ala  
6885 6890 6895

Asn Lys Trp Asp Leu Ile Ile Ser Asp Met Tyr Asp Pro Arg Thr Lys  
6900 6905 6910

His Val Thr Lys Glu Asn Asp Ser Lys Glu Gly Phe Phe Thr Tyr Leu  
6915 6920 6925

Cys Gly Phe Ile Lys Gln Lys Leu Ala Leu Gly Gly Ser Ile Ala Val  
6930 6935 6940

Lys Ile Thr Glu His Ser Trp Asn Ala Asp Leu Tyr Lys Leu Met Gly  
6945 6950 6955 6960

His Phe Ser Trp Trp Thr Ala Phe Val Thr Asn Val Asn Ala Ser Ser  
6965 6970 6975

Ser Glu Ala Phe Leu Ile Gly Ala Asn Tyr Leu Gly Lys Pro Lys Glu  
6980 6985 6990

Gln Ile Asp Gly Tyr Thr Met His Ala Asn Tyr Ile Phe Trp Arg Asn  
6995 7000 7005

Thr Asn Pro Ile Gln Leu Ser Ser Tyr Ser Leu Phe Asp Met Ser Lys  
7010 7015 7020

Phe Pro Leu Lys Leu Arg Gly Thr Ala Val Met Ser Leu Lys Glu Asn  
7025 7030 7035 7040

Gln Ile Asn Asp Met Ile Tyr Ser Leu Leu Glu Lys Gly Arg Leu Ile  
7045 7050 7055

Ile Arg Glu Asn Asn Arg Val Val Val Ser Ser Asp Ile Leu Val Asn  
7060 7065 7070

Asn

<210> 9961  
<211> 4382  
<212> PRT  
<213> SARS coronavirus

<400> 9961  
Met Glu Ser Leu Val Leu Gly Val Asn Glu Lys Thr His Val Gln Leu  
1 5 10 15

Ser Leu Pro Val Leu Gln Val Arg Asp Val Leu Val Arg Gly Phe Gly  
20 25 30

Asp Ser Val Glu Glu Ala Leu Ser Glu Ala Arg Glu His Leu Lys Asn  
35 40 45

SEQLIST-20480.TXT

Gly Thr Cys Gly Leu Val Glu Leu Glu Lys Gly Val Leu Pro Gln Leu  
50 55 60  
Glu Gln Pro Tyr Val Phe Ile Lys Arg Ser Asp Ala Leu Ser Thr Asn  
65 70 75 80  
His Gly His Lys Val Val Glu Leu Val Ala Glu Met Asp Gly Ile Gln  
85 90 95  
Tyr Gly Arg Ser Gly Ile Thr Leu Gly Val Leu Val Pro His Val Gly  
100 105 110  
Glu Thr Pro Ile Ala Tyr Arg Asn Val Leu Leu Arg Lys Asn Gly Asn  
115 120 125  
Lys Gly Ala Gly Gly His Ser Tyr Gly Ile Asp Leu Lys Ser Tyr Asp  
130 135 140  
Leu Gly Asp Glu Leu Gly Thr Asp Pro Ile Glu Asp Tyr Glu Gln Asn  
145 150 155 160  
Trp Asn Thr Lys His Gly Ser Gly Ala Leu Arg Glu Leu Thr Arg Glu  
165 170 175  
Leu Asn Gly Gly Ala Val Thr Arg Tyr Val Asp Asn Asn Phe Cys Gly  
180 185 190  
Pro Asp Gly Tyr Pro Leu Asp Cys Ile Lys Asp Phe Leu Ala Arg Ala  
195 200 205  
Gly Lys Ser Met Cys Thr Leu Ser Glu Gln Leu Asp Tyr Ile Glu Ser  
210 215 220  
Lys Arg Gly Val Tyr Cys Cys Arg Asp His Glu His Glu Ile Ala Trp  
225 230 235 240  
Phe Thr Glu Arg Ser Asp Lys Ser Tyr Glu His Gln Thr Pro Phe Glu  
245 250 255  
Ile Lys Ser Ala Lys Lys Phe Asp Thr Phe Lys Gly Glu Cys Pro Lys  
260 265 270  
Phe Val Phe Pro Leu Asn Ser Lys Val Lys Val Ile Gln Pro Arg Val  
275 280 285  
Glu Lys Lys Lys Thr Glu Gly Phe Met Gly Arg Ile Arg Ser Val Tyr  
290 295 300  
Pro Val Ala Ser Pro Gln Glu Cys Asn Asn Met His Leu Ser Thr Leu  
305 310 315 320  
Met Lys Cys Asn His Cys Asp Glu Val Ser Trp Gln Thr Cys Asp Phe  
325 330 335  
Leu Lys Ala Thr Cys Glu His Cys Gly Thr Glu Asn Leu Val Ile Glu  
340 345 350  
Gly Pro Thr Thr Cys Gly Tyr Leu Pro Thr Asn Ala Val Val Lys Met  
355 360 365  
Pro Cys Pro Ala Cys Gln Asp Pro Glu Ile Gly Pro Glu His Ser Val  
370 375 380

SEQLIST-20480.TXT

Ala Asp Tyr His Asn His Ser Asn Ile Glu Thr Arg Leu Arg Lys Gly  
385 390 395 400  
Gly Arg Thr Arg Cys Phe Gly Gly Cys Val Phe Ala Tyr Val Gly Cys  
405 410 415  
Tyr Asn Lys Arg Ala Tyr Trp Val Pro Arg Ala Ser Ala Asp Ile Gly  
420 425 430  
Ser Gly His Thr Gly Ile Thr Gly Asp Asn Val Glu Thr Leu Asn Glu  
435 440 445  
Asp Leu Leu Glu Ile Leu Ser Arg Glu Arg Val Asn Ile Asn Ile Val  
450 455 460  
Gly Asp Phe His Leu Asn Glu Glu Val Ala Ile Ile Leu Ala Ser Phe  
465 470 475 480  
Ser Ala Ser Thr Ser Ala Phe Ile Asp Thr Ile Lys Ser Leu Asp Tyr  
485 490 495  
Lys Ser Phe Lys Thr Ile Val Glu Ser Cys Gly Asn Tyr Lys Val Thr  
500 505 510  
Lys Gly Lys Pro Val Lys Gly Ala Trp Asn Ile Gly Gln Gln Arg Ser  
515 520 525  
Val Leu Thr Pro Leu Cys Gly Phe Pro Ser Gln Ala Ala Gly Val Ile  
530 535 540  
Arg Ser Ile Phe Ala Arg Thr Leu Asp Ala Ala Asn His Ser Ile Pro  
545 550 555 560  
Asp Leu Gln Arg Ala Ala Val Thr Ile Leu Asp Gly Ile Ser Glu Gln  
565 570 575  
Ser Leu Arg Leu Val Asp Ala Met Val Tyr Thr Ser Asp Leu Leu Thr  
580 585 590  
Asn Ser Val Ile Ile Met Ala Tyr Val Thr Gly Gly Leu Val Gln Gln  
595 600 605  
Thr Ser Gln Trp Leu Ser Asn Leu Leu Gly Thr Thr Val Glu Lys Leu  
610 615 620  
Arg Pro Ile Phe Glu Trp Ile Glu Ala Lys Leu Ser Ala Gly Val Glu  
625 630 635 640  
Phe Leu Lys Asp Ala Trp Glu Ile Leu Lys Phe Leu Ile Thr Gly Val  
645 650 655  
Phe Asp Ile Val Lys Gly Gln Ile Gln Val Ala Ser Asp Asn Ile Lys  
660 665 670  
Asp Cys Val Lys Cys Phe Ile Asp Val Val Asn Lys Ala Leu Glu Met  
675 680 685  
Cys Ile Asp Gln Val Thr Ile Ala Gly Ala Lys Leu Arg Ser Leu Asn  
690 695 700  
Leu Gly Glu Val Phe Ile Ala Gln Ser Lys Gly Leu Tyr Arg Gln Cys  
705 710 715 720

SEQLIST-20480.TXT

Ile Arg Gly Lys Glu Gln Leu Gln Leu Leu Met Pro Leu Lys Ala Pro  
725 730 735  
Lys Glu Val Thr Phe Leu Glu Gly Asp Ser His Asp Thr Val Leu Thr  
740 745 750  
Ser Glu Glu Val Val Leu Lys Asn Gly Glu Leu Glu Thr Leu Glu Thr  
755 760 765  
Pro Val Asp Ser Phe Thr Asn Gly Ala Ile Val Gly Thr Pro Val Cys  
770 775 780  
Val Asn Gly Leu Met Leu Leu Glu Ile Lys Asp Lys Glu Gln Tyr Cys  
785 790 795 800  
Ala Leu Ser Pro Gly Leu Leu Ala Thr Asn Asn Val Phe Arg Leu Lys  
805 810 815  
Gly Gly Ala Pro Ile Lys Gly Val Thr Phe Gly Glu Asp Thr Val Trp  
820 825 830  
Glu Val Gln Gly Tyr Lys Asn Val Arg Ile Thr Phe Glu Leu Asp Glu  
835 840 845  
Arg Val Asp Lys Val Leu Asn Glu Lys Cys Ser Val Tyr Thr Val Glu  
850 855 860  
Ser Gly Thr Glu Val Thr Glu Phe Ala Cys Val Val Ala Glu Ala Val  
865 870 875 880  
Val Lys Thr Leu Gln Pro Val Ser Asp Leu Leu Thr Asn Met Gly Ile  
885 890 895  
Asp Leu Asp Glu Trp Ser Val Ala Thr Phe Tyr Leu Phe Asp Asp Ala  
900 905 910  
Gly Glu Glu Asn Phe Ser Ser Arg Met Tyr Cys Ser Phe Tyr Pro Pro  
915 920 925  
Asp Glu Glu Glu Glu Asp Asp Ala Glu Cys Glu Glu Glu Glu Ile Asp  
930 935 940  
Glu Thr Cys Glu His Glu Tyr Gly Thr Glu Asp Asp Tyr Gln Gly Leu  
945 950 955 960  
Pro Leu Glu Phe Gly Ala Ser Ala Glu Thr Val Arg Val Glu Glu Glu  
965 970 975  
Glu Glu Glu Asp Trp Leu Asp Asp Thr Thr Glu Gln Ser Glu Ile Glu  
980 985 990  
Pro Glu Pro Glu Pro Thr Pro Glu Glu Pro Val Asn Gln Phe Thr Gly  
995 1000 1005  
Tyr Leu Lys Leu Thr Asp Asn Val Ala Ile Lys Cys Val Asp Ile Val  
1010 1015 1020  
Lys Glu Ala Gln Ser Ala Asn Pro Met Val Ile Val Asn Ala Ala Asn  
1025 1030 1035 1040  
Ile His Leu Lys His Gly Gly Gly Val Ala Gly Ala Leu Asn Lys Ala  
1045 1050 1055

SEQLIST-20480.TXT

Thr Asn Gly Ala Met Gln Lys Glu Ser Asp Asp Tyr Ile Lys Leu Asn  
1060 1065 1070  
Gly Pro Leu Thr Val Gly Gly Ser Cys Leu Leu Ser Gly His Asn Leu  
1075 1080 1085  
Ala Lys Lys Cys Leu His Val Val Gly Pro Asn Leu Asn Ala Gly Glu  
1090 1095 1100  
Asp Ile Gln Leu Leu Lys Ala Ala Tyr Glu Asn Phe Asn Ser Gln Asp  
1105 1110 1115 1120  
Ile Leu Leu Ala Pro Leu Leu Ser Ala Gly Ile Phe Gly Ala Lys Pro  
1125 1130 1135  
Leu Gln Ser Leu Gln Val Cys Val Gln Thr Val Arg Thr Gln Val Tyr  
1140 1145 1150  
Ile Ala Val Asn Asp Lys Ala Leu Tyr Glu Gln Val Val Met Asp Tyr  
1155 1160 1165  
Leu Asp Asn Leu Lys Pro Arg Val Glu Ala Pro Lys Gln Glu Glu Pro  
1170 1175 1180  
Pro Asn Thr Glu Asp Ser Lys Thr Glu Glu Lys Ser Val Val Gln Lys  
1185 1190 1195 1200  
Pro Val Asp Val Lys Pro Lys Ile Lys Ala Cys Ile Asp Glu Val Thr  
1205 1210 1215  
Thr Thr Leu Glu Glu Thr Lys Phe Leu Thr Asn Lys Leu Leu Leu Phe  
1220 1225 1230  
Ala Asp Ile Asn Gly Lys Leu Tyr His Asp Ser Gln Asn Met Leu Arg  
1235 1240 1245  
Gly Glu Asp Met Ser Phe Leu Glu Lys Asp Ala Pro Tyr Met Val Gly  
1250 1255 1260  
Asp Val Ile Thr Ser Gly Asp Ile Thr Cys Val Val Ile Pro Ser Lys  
1265 1270 1275 1280  
Lys Ala Gly Gly Thr Thr Glu Met Leu Ser Arg Ala Leu Lys Lys Val  
1285 1290 1295  
Pro Val Asp Glu Tyr Ile Thr Thr Tyr Pro Gly Gln Gly Cys Ala Gly  
1300 1305 1310  
Tyr Thr Leu Glu Glu Ala Lys Thr Ala Leu Lys Lys Cys Lys Ser Ala  
1315 1320 1325  
Phe Tyr Val Leu Pro Ser Glu Ala Pro Asn Ala Lys Glu Glu Ile Leu  
1330 1335 1340  
Gly Thr Val Ser Trp Asn Leu Arg Glu Met Leu Ala His Ala Glu Glu  
1345 1350 1355 1360  
Thr Arg Lys Leu Met Pro Ile Cys Met Asp Val Arg Ala Ile Met Ala  
1365 1370 1375  
Thr Ile Gln Arg Lys Tyr Lys Gly Ile Lys Ile Gln Glu Gly Ile Val  
1380 1385 1390

SEQLIST-20480.TXT

Asp Tyr Gly Val Arg Phe Phe Phe Tyr Thr Ser Lys Glu Pro Val Ala  
 1395 1400 1405  
 Ser Ile Ile Thr Lys Leu Asn Ser Leu Asn Glu Pro Leu Val Thr Met  
 1410 1415 1420  
 Pro Ile Gly Tyr Val Thr His Gly Phe Asn Leu Glu Glu Ala Ala Arg  
 1425 1430 1435 1440  
 Cys Met Arg Ser Leu Lys Ala Pro Ala Val Val Ser Val Ser Ser Pro  
 1445 1450 1455  
 Asp Ala Val Thr Thr Tyr Asn Gly Tyr Leu Thr Ser Ser Ser Lys Thr  
 1460 1465 1470  
 Ser Glu Glu His Phe Val Glu Thr Val Ser Leu Ala Gly Ser Tyr Arg  
 1475 1480 1485  
 Asp Trp Ser Tyr Ser Gly Gln Arg Thr Glu Leu Gly Val Glu Phe Leu  
 1490 1495 1500  
 Lys Arg Gly Asp Lys Ile Val Tyr His Thr Leu Glu Ser Pro Val Glu  
 1505 1510 1515 1520  
 Phe His Leu Asp Gly Glu Val Leu Ser Leu Asp Lys Leu Lys Ser Leu  
 1525 1530 1535  
 Leu Ser Leu Arg Glu Val Lys Thr Ile Lys Val Phe Thr Thr Val Asp  
 1540 1545 1550  
 Asn Thr Asn Leu His Thr Gln Leu Val Asp Met Ser Met Thr Tyr Gly  
 1555 1560 1565  
 Gln Gln Phe Gly Pro Thr Tyr Leu Asp Gly Ala Asp Val Thr Lys Ile  
 1570 1575 1580  
 Lys Pro His Val Asn His Glu Gly Lys Thr Phe Phe Val Leu Pro Ser  
 1585 1590 1595 1600  
 Asp Asp Thr Leu Arg Ser Glu Ala Phe Glu Tyr Tyr His Thr Leu Asp  
 1605 1610 1615  
 Glu Ser Phe Leu Gly Arg Tyr Met Ser Ala Leu Asn His Thr Lys Lys  
 1620 1625 1630  
 Trp Lys Phe Pro Gln Val Gly Gly Leu Thr Ser Ile Lys Trp Ala Asp  
 1635 1640 1645  
 Asn Asn Cys Tyr Leu Ser Ser Val Leu Leu Ala Leu Gln Gln Leu Glu  
 1650 1655 1660  
 Val Lys Phe Asn Ala Pro Ala Leu Gln Glu Ala Tyr Tyr Arg Ala Arg  
 1665 1670 1675 1680  
 Ala Gly Asp Ala Ala Asn Phe Cys Ala Leu Ile Leu Ala Tyr Ser Asn  
 1685 1690 1695  
 Lys Thr Val Gly Glu Leu Gly Asp Val Arg Glu Thr Met Thr His Leu  
 1700 1705 1710  
 Leu Gln His Ala Asn Leu Glu Ser Ala Lys Arg Val Leu Asn Val Val  
 1715 1720 1725

SEQLIST-20480.TXT

Cys Lys His Cys Gly Gln Lys Thr Thr Thr Leu Thr Gly Val Glu Ala  
 1730 1735 1740  
 Val Met Tyr Met Gly Thr Leu Ser Tyr Asp Asn Leu Lys Thr Gly Val  
 1745 1750 1755 1760  
 Ser Ile Pro Cys Val Cys Gly Arg Asp Ala Thr Gln Tyr Leu Val Gln  
 1765 1770 1775  
 Gln Glu Ser Ser Phe Val Met Met Ser Ala Pro Pro Ala Glu Tyr Lys  
 1780 1785 1790  
 Leu Gln Gln Gly Thr Phe Leu Cys Ala Asn Glu Tyr Thr Gly Asn Tyr  
 1795 1800 1805  
 Gln Cys Gly His Tyr Thr His Ile Thr Ala Lys Glu Thr Leu Tyr Arg  
 1810 1815 1820  
 Ile Asp Gly Ala His Leu Thr Lys Met Ser Glu Tyr Lys Gly Pro Val  
 1825 1830 1835 1840  
 Thr Asp Val Phe Tyr Lys Glu Thr Ser Tyr Thr Thr Thr Ile Lys Pro  
 1845 1850 1855  
 Val Ser Tyr Lys Leu Asp Gly Val Thr Tyr Thr Glu Ile Glu Pro Lys  
 1860 1865 1870  
 Leu Asp Gly Tyr Tyr Lys Lys Asp Asn Ala Tyr Tyr Thr Glu Gln Pro  
 1875 1880 1885  
 Ile Asp Leu Val Pro Thr Gln Pro Leu Pro Asn Ala Ser Phe Asp Asn  
 1890 1895 1900  
 Phe Lys Leu Thr Cys Ser Asn Thr Lys Phe Ala Asp Asp Leu Asn Gln  
 1905 1910 1915 1920  
 Met Thr Gly Phe Thr Lys Pro Ala Ser Arg Glu Leu Ser Val Thr Phe  
 1925 1930 1935  
 Phe Pro Asp Leu Asn Gly Asp Val Val Ala Ile Asp Tyr Arg His Tyr  
 1940 1945 1950  
 Ser Ala Ser Phe Lys Lys Gly Ala Lys Leu Leu His Lys Pro Ile Val  
 1955 1960 1965  
 Trp His Ile Asn Gln Ala Thr Thr Lys Thr Thr Phe Lys Pro Asn Thr  
 1970 1975 1980  
 Trp Cys Leu Arg Cys Leu Trp Ser Thr Lys Pro Val Asp Thr Ser Asn  
 1985 1990 1995 2000  
 Ser Phe Glu Val Leu Ala Val Glu Asp Thr Gln Gly Met Asp Asn Leu  
 2005 2010 2015  
 Ala Cys Glu Ser Gln Gln Pro Thr Ser Glu Glu Val Val Glu Asn Pro  
 2020 2025 2030  
 Thr Ile Gln Lys Glu Val Ile Glu Cys Asp Val Lys Thr Thr Glu Val  
 2035 2040 2045  
 Val Gly Asn Val Ile Leu Lys Pro Ser Asp Glu Gly Val Lys Val Thr  
 2050 2055 2060



SEQLIST-20480.TXT

Gln Glu Leu Gly His Glu Asp Leu Met Ala Ala Tyr Val Glu Asn Thr  
2065 2070 2075 2080

Ser Ile Thr Ile Lys Lys Pro Asn Glu Leu Ser Leu Ala Leu Gly Leu  
2085 2090 2095

Lys Thr Ile Ala Thr His Gly Ile Ala Ala Ile Asn Ser Val Pro Trp  
2100 2105 2110

Ser Lys Ile Leu Ala Tyr Val Lys Pro Phe Leu Gly Gln Ala Ala Ile  
2115 2120 2125

Thr Thr Ser Asn Cys Ala Lys Arg Leu Ala Gln Arg Val Phe Asn Asn  
2130 2135 2140

Tyr Met Pro Tyr Val Phe Thr Leu Leu Phe Gln Leu Cys Thr Phe Thr  
2145 2150 2155 2160

Lys Ser Thr Asn Ser Arg Ile Arg Ala Ser Leu Pro Thr Thr Ile Ala  
2165 2170 2175

Lys Asn Ser Val Lys Ser Val Ala Lys Leu Cys Leu Asp Ala Gly Ile  
2180 2185 2190

Asn Tyr Val Lys Ser Pro Lys Phe Ser Lys Leu Phe Thr Ile Ala Met  
2195 2200 2205

Trp Leu Leu Leu Leu Ser Ile Cys Leu Gly Ser Leu Ile Cys Val Thr  
2210 2215 2220

Ala Ala Phe Gly Val Leu Leu Ser Asn Phe Gly Ala Pro Ser Tyr Cys  
2225 2230 2235 2240

Asn Gly Val Arg Glu Leu Tyr Leu Asn Ser Ser Asn Val Thr Thr Met  
2245 2250 2255

Asp Phe Cys Glu Gly Ser Phe Pro Cys Ser Ile Cys Leu Ser Gly Leu  
2260 2265 2270

Asp Ser Leu Asp Ser Tyr Pro Ala Leu Glu Thr Ile Gln Val Thr Ile  
2275 2280 2285

Ser Ser Tyr Lys Leu Asp Leu Thr Ile Leu Gly Leu Ala Ala Glu Trp  
2290 2295 2300

Val Leu Ala Tyr Met Leu Phe Thr Lys Phe Phe Tyr Leu Leu Gly Leu  
2305 2310 2315 2320

Ser Ala Ile Met Gln Val Phe Phe Gly Tyr Phe Ala Ser His Phe Ile  
2325 2330 2335

Ser Asn Ser Trp Leu Met Trp Phe Ile Ile Ser Ile Val Gln Met Ala  
2340 2345 2350

Pro Val Ser Ala Met Val Arg Met Tyr Ile Phe Phe Ala Ser Phe Tyr  
2355 2360 2365

Tyr Ile Trp Lys Ser Tyr Val His Ile Met Asp Gly Cys Thr Ser Ser  
2370 2375 2380

Thr Cys Met Met Cys Tyr Lys Arg Asn Arg Ala Thr Arg Val Glu Cys  
2385 2390 2395 2400

SEQLIST-20480.TXT

Thr Thr Ile Val Asn Gly Met Lys Arg Ser Phe Tyr Val Tyr Ala Asn  
2405 2410 2415

Gly Gly Arg Gly Phe Cys Lys Thr His Asn Trp Asn Cys Leu Asn Cys  
2420 2425 2430

Asp Thr Phe Cys Thr Gly Ser Thr Phe Ile Ser Asp Glu Val Ala Arg  
2435 2440 2445

Asp Leu Ser Leu Gln Phe Lys Arg Pro Ile Asn Pro Thr Asp Gln Ser  
2450 2455 2460

Ser Tyr Ile Val Asp Ser Val Ala Val Lys Asn Gly Ala Leu His Leu  
2465 2470 2475 2480

Tyr Phe Asp Lys Ala Gly Gln Lys Thr Tyr Glu Arg His Pro Leu Ser  
2485 2490 2495

His Phe Val Asn Leu Asp Asn Leu Arg Ala Asn Asn Thr Lys Gly Ser  
2500 2505 2510

Leu Pro Ile Asn Val Ile Val Phe Asp Gly Lys Ser Lys Cys Asp Glu  
2515 2520 2525

Ser Ala Ser Lys Ser Ala Ser Val Tyr Tyr Ser Gln Leu Met Cys Gln  
2530 2535 2540

Pro Ile Leu Leu Leu Asp Gln Ala Leu Val Ser Asp Val Gly Asp Ser  
2545 2550 2555 2560

Thr Glu Val Ser Val Lys Met Phe Asp Ala Tyr Val Asp Thr Phe Ser  
2565 2570 2575

Ala Thr Phe Ser Val Pro Met Glu Lys Leu Lys Ala Leu Val Ala Thr  
2580 2585 2590

Ala His Ser Glu Leu Ala Lys Gly Val Ala Leu Asp Gly Val Leu Ser  
2595 2600 2605

Thr Phe Val Ser Ala Ala Arg Gln Gly Val Val Asp Thr Asp Val Asp  
2610 2615 2620

Thr Lys Asp Val Ile Glu Cys Leu Lys Leu Ser His His Ser Asp Leu  
2625 2630 2635 2640

Glu Val Thr Gly Asp Ser Cys Asn Asn Phe Met Leu Thr Tyr Asn Lys  
2645 2650 2655

Val Glu Asn Met Thr Pro Arg Asp Leu Gly Ala Cys Ile Asp Cys Asn  
2660 2665 2670

Ala Arg His Ile Asn Ala Gln Val Ala Lys Ser His Asn Val Ser Leu  
2675 2680 2685

Ile Trp Asn Val Lys Asp Tyr Met Ser Leu Ser Glu Gln Leu Arg Lys  
2690 2695 2700

Gln Ile Arg Ser Ala Ala Lys Lys Asn Asn Ile Pro Phe Arg Leu Thr  
2705 2710 2715 2720

Cys Ala Thr Thr Arg Gln Val Val Asn Val Ile Thr Thr Lys Ile Ser  
2725 2730 2735

SEQLIST-20480.TXT

Leu Lys Gly Gly Lys Ile Val Ser Thr Cys Phe Lys Leu Met Leu Lys  
 2740 2745 2750  
 Ala Thr Leu Leu Cys Val Leu Ala Ala Leu Val Cys Tyr Ile Val Met  
 2755 2760 2765  
 Pro Val His Thr Leu Ser Ile His Asp Gly Tyr Thr Asn Glu Ile Ile  
 2770 2775 2780  
 Gly Tyr Lys Ala Ile Gln Asp Gly Val Thr Arg Asp Ile Ile Ser Thr  
 2785 2790 2795 2800  
 Asp Asp Cys Phe Ala Asn Lys His Ala Gly Phe Asp Ala Trp Phe Ser  
 2805 2810 2815  
 Gln Arg Gly Gly Ser Tyr Lys Asn Asp Lys Ser Cys Pro Val Val Ala  
 2820 2825 2830  
 Ala Ile Ile Thr Arg Glu Ile Gly Phe Ile Val Pro Gly Leu Pro Gly  
 2835 2840 2845  
 Thr Val Leu Arg Ala Ile Asn Gly Asp Phe Leu His Phe Leu Pro Arg  
 2850 2855 2860  
 Val Phe Ser Ala Val Gly Asn Ile Cys Tyr Thr Pro Ser Lys Leu Ile  
 2865 2870 2875 2880  
 Glu Tyr Ser Asp Phe Ala Thr Ser Ala Cys Val Leu Ala Ala Glu Cys  
 2885 2890 2895  
 Thr Ile Phe Lys Asp Ala Met Gly Lys Pro Val Pro Tyr Cys Tyr Asp  
 2900 2905 2910  
 Thr Asn Leu Leu Glu Gly Ser Ile Ser Tyr Ser Glu Leu Arg Pro Asp  
 2915 2920 2925  
 Thr Arg Tyr Val Leu Met Asp Gly Ser Ile Ile Gln Phe Pro Asn Thr  
 2930 2935 2940  
 Tyr Leu Glu Gly Ser Val Arg Val Val Thr Thr Phe Asp Ala Glu Tyr  
 2945 2950 2955 2960  
 Cys Arg His Gly Thr Cys Glu Arg Ser Glu Val Gly Ile Cys Leu Ser  
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 Thr Ser Gly Arg Trp Val Leu Asn Asn Glu His Tyr Arg Ala Leu Ser  
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 Gly Val Phe Cys Gly Val Asp Ala Met Asn Leu Ile Ala Asn Ile Phe  
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 Val Ala Gly Gly Ile Ile Ala Ile Leu Val Thr Cys Ala Ala Tyr Tyr  
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Trp Phe Ala Met Phe Ser Pro Ile Val Pro Phe Trp Ile Thr Ala Ile  
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Tyr Val Phe Cys Ile Ser Leu Lys His Cys His Trp Phe Phe Asn Asn  
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Tyr Leu Arg Lys Arg Val Met Phe Asn Gly Val Thr Phe Ser Thr Phe  
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Glu Glu Ala Ala Leu Cys Thr Phe Leu Leu Asn Lys Glu Met Tyr Leu  
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Lys Leu Arg Ser Glu Thr Leu Leu Pro Leu Thr Gln Tyr Asn Arg Tyr  
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Leu Ala Leu Tyr Asn Lys Tyr Lys Tyr Phe Ser Gly Ala Leu Asp Thr  
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Thr Ser Tyr Arg Glu Ala Ala Cys Cys His Leu Ala Lys Ala Leu Asn  
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Asp Phe Ser Asn Ser Gly Ala Asp Val Leu Tyr Gln Pro Pro Gln Thr  
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Ser Ile Thr Ser Ala Val Leu Gln Ser Gly Phe Arg Lys Met Ala Phe  
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Pro Ser Gly Lys Val Glu Gly Cys Met Val Gln Val Thr Cys Gly Thr  
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His Val Ile Cys Thr Ala Glu Asp Met Leu Asn Pro Asn Tyr Glu Asp  
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Leu Leu Ile Arg Lys Ser Asn His Ser Phe Leu Val Gln Ala Gly Asn  
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Val Gln Leu Arg Val Ile Gly His Ser Met Gln Asn Cys Leu Leu Arg  
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Leu Lys Val Asp Thr Ser Asn Pro Lys Thr Pro Lys Tyr Lys Phe Val  
3330 3335 3340

Arg Ile Gln Pro Gly Gln Thr Phe Ser Val Leu Ala Cys Tyr Asn Gly  
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Ser Pro Ser Gly Val Tyr Gln Cys Ala Met Arg Pro Asn His Thr Ile  
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Lys Gly Ser Phe Leu Asn Gly Ser Cys Gly Ser Val Gly Phe Asn Ile  
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Asp Tyr Asp Cys Val Ser Phe Cys Tyr Met His His Met Glu Leu Pro  
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Thr Gly Val His Ala Gly Thr Asp Leu Glu Gly Lys Phe Tyr Gly Pro  
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 Ala Leu Val Leu Leu Ile Leu Met Thr Ala Arg Thr Val Tyr Asp Asp  
 3665 3670 3675 3680  
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 Lys Val Tyr Tyr Gly Asn Ala Leu Asp Gln Ala Ile Ser Met Trp Ala  
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 Met Phe Leu Ala Arg Ala Ile Val Phe Val Cys Val Glu Tyr Tyr Pro  
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Leu Leu Phe Ile Thr Gly Asn Thr Leu Gln Cys Ile Met Leu Val Tyr  
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 Ser Thr Gln Glu Phe Arg Tyr Met Asn Ser Gln Gly Leu Leu Pro Pro  
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 Val Val Val Pro Asp Tyr Gly Thr Tyr Lys Asn Thr Cys Asp Gly Asn  
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 Thr Phe Thr Tyr Ala Ser Ala Leu Trp Glu Ile Gln Gln Val Val Asp  
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Ala Asp Ser Lys Ile Val Gln Leu Ser Glu Ile Asn Met Asp Asn Ser  
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Pro Asn Leu Ala Trp Pro Leu Ile Val Thr Ala Leu Arg Ala Asn Ser  
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Ala Val Lys Leu Gln Asn Asn Glu Leu Ser Pro Val Ala Leu Arg Gln  
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Met Ser Cys Ala Ala Gly Thr Thr Gln Thr Ala Cys Thr Asp Asp Asn  
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Ala Leu Ala Tyr Tyr Asn Asn Ser Lys Gly Gly Arg Phe Val Leu Ala  
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Leu Leu Ser Asp His Gln Asp Leu Lys Trp Ala Arg Phe Pro Lys Ser  
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Asp Gly Thr Gly Thr Ile Tyr Thr Glu Leu Glu Pro Pro Cys Arg Phe  
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Val Thr Asp Thr Pro Lys Gly Pro Lys Val Lys Tyr Leu Tyr Phe Ile  
4195 4200 4205

Lys Gly Leu Asn Asn Leu Asn Arg Gly Met Val Leu Gly Ser Leu Ala  
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Ala Thr Val Arg Leu Gln Ala Gly Asn Ala Thr Glu Val Pro Ala Asn  
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Ser Thr Val Leu Ser Phe Cys Ala Phe Ala Val Asp Pro Ala Lys Ala  
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Tyr Lys Asp Tyr Leu Ala Ser Gly Gly Gln Pro Ile Thr Asn Cys Val  
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Lys Met Leu Cys Thr His Thr Gly Thr Gly Gln Ala Ile Thr Val Thr  
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Pro Glu Ala Asn Met Asp Gln Glu Ser Phe Gly Gly Ala Ser Cys Cys  
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Leu Tyr Cys Arg Cys His Ile Asp His Pro Asn Pro Lys Gly Phe Cys  
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Asp Leu Lys Gly Lys Tyr Val Gln Ile Pro Thr Thr Cys Ala Asn Asp  
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Pro Val Gly Phe Thr Leu Arg Asn Thr Val Cys Thr Val Cys Gly Met  
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35      40      45
Ser Asp Thr Leu Tyr Leu Thr Gln Asp Leu Phe Leu Pro Phe Tyr Ser
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Asn Val Thr Gly Phe His Thr Ile Asn His Thr Phe Gly Asn Pro Val
65      70      75      80
Ile Pro Phe Lys Asp Gly Ile Tyr Phe Ala Ala Thr Glu Lys Ser Asn
85      90      95
Val Val Arg Gly Trp Val Phe Gly Ser Thr Met Asn Asn Lys Ser Gln
100     105     110
Ser Val Ile Ile Ile Asn Asn Ser Thr Asn Val Val Ile Arg Ala Cys
115     120     125
Asn Phe Glu Leu Cys Asp Asn Pro Phe Phe Ala Val Ser Lys Pro Met
130     135     140
Gly Thr Gln Thr His Thr Met Ile Phe Asp Asn Ala Phe Asn Cys Thr
145     150     155     160
Phe Glu Tyr Ile Ser Asp Ala Phe Ser Leu Asp Val Ser Glu Lys Ser
165     170     175
Gly Asn Phe Lys His Leu Arg Glu Phe Val Phe Lys Asn Lys Asp Gly
180     185     190
Phe Leu Tyr Val Tyr Lys Gly Tyr Gln Pro Ile Asp Val Val Arg Asp
195     200     205
Leu Pro Ser Gly Phe Asn Thr Leu Lys Pro Ile Phe Lys Leu Pro Leu
210     215     220
Gly Ile Asn Ile Thr Asn Phe Arg Ala Ile Leu Thr Ala Phe Ser Pro
225     230     235     240
Ala Gln Asp Ile Trp Gly Thr Ser Ala Ala Ala Tyr Phe Val Gly Tyr
245     250     255
Leu Lys Pro Thr Thr Phe Met Leu Lys Tyr Asp Glu Asn Gly Thr Ile
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Thr Asp Ala Val Asp Cys Ser Gln Asn Pro Leu Ala Glu Leu Lys Cys
275     280     285
Ser Val Lys Ser Phe Glu Ile Asp Lys Gly Ile Tyr Gln Thr Ser Asn
290     295     300
Phe Arg Val Val Pro Ser Gly Asp Val Val Arg Phe Pro Asn Ile Thr
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Val Tyr Ala Trp Glu Arg Lys Lys Ile Ser Asn Cys Val Ala Asp Tyr  
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 Val Ser Ala Thr Lys Leu Asn Asp Leu Cys Phe Ser Asn Val Tyr Ala  
 370 375 380  
 Asp Ser Phe Val Val Lys Gly Asp Asp Val Arg Gln Ile Ala Pro Gly  
 385 390 395 400  
 Gln Thr Gly Val Ile Ala Asp Tyr Asn Tyr Lys Leu Pro Asp Asp Phe  
 405 410 415  
 Met Gly Cys Val Leu Ala Trp Asn Thr Arg Asn Ile Asp Ala Thr Ser  
 420 425 430  
 Thr Gly Asn Tyr Asn Tyr Lys Tyr Arg Tyr Leu Arg His Gly Lys Leu  
 435 440 445  
 Arg Pro Phe Glu Arg Asp Ile Ser Asn Val Pro Phe Ser Pro Asp Gly  
 450 455 460  
 Lys Pro Cys Thr Pro Pro Ala Leu Asn Cys Tyr Trp Pro Leu Asn Asp  
 465 470 475 480  
 Tyr Gly Phe Tyr Thr Thr Thr Gly Ile Gly Tyr Gln Pro Tyr Arg Val  
 485 490 495  
 Val Val Leu Ser Phe Glu Leu Leu Asn Ala Pro Ala Thr Val Cys Gly  
 500 505 510  
 Pro Lys Leu Ser Thr Asp Leu Ile Lys Asn Gln Cys Val Asn Phe Asn  
 515 520 525  
 Phe Asn Gly Leu Thr Gly Thr Gly Val Leu Thr Pro Ser Ser Lys Arg  
 530 535 540  
 Phe Gln Pro Phe Gln Gln Phe Gly Arg Asp Val Ser Asp Phe Thr Asp  
 545 550 555 560  
 Ser Val Arg Asp Pro Lys Thr Ser Glu Ile Leu Asp Ile Ser Pro Cys  
 565 570 575  
 Ser Phe Gly Gly Val Ser Val Ile Thr Pro Gly Thr Asn Ala Ser Ser  
 580 585 590  
 Glu Val Ala Val Leu Tyr Gln Asp Val Asn Cys Thr Asp Val Ser Thr  
 595 600 605  
 Ala Ile His Ala Asp Gln Leu Thr Pro Ala Trp Arg Ile Tyr Ser Thr  
 610 615 620  
 Gly Asn Asn Val Phe Gln Thr Gln Ala Gly Cys Leu Ile Gly Ala Glu  
 625 630 635 640  
 His Val Asp Thr Ser Tyr Glu Cys Asp Ile Pro Ile Gly Ala Gly Ile  
 645 650 655  
 Cys Ala Ser Tyr His Thr Val Ser Leu Leu Arg Ser Thr Ser Gln Lys  
 660 665 670

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Ser Ile Val Ala Tyr Thr Met Ser Leu Gly Ala Asp Ser Ser Ile Ala  
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Tyr Ser Asn Asn Thr Ile Ala Ile Pro Thr Asn Phe Ser Ile Ser Ile  
690 695 700  
Thr Thr Glu Val Met Pro Val Ser Met Ala Lys Thr Ser Val Asp Cys  
705 710 715 720  
Asn Met Tyr Ile Cys Gly Asp Ser Thr Glu Cys Ala Asn Leu Leu Leu  
725 730 735  
Gln Tyr Gly Ser Phe Cys Thr Gln Leu Asn Arg Ala Leu Ser Gly Ile  
740 745 750  
Ala Ala Glu Gln Asp Arg Asn Thr Arg Glu Val Phe Ala Gln Val Lys  
755 760 765  
Gln Met Tyr Lys Thr Pro Thr Leu Lys Tyr Phe Gly Gly Phe Asn Phe  
770 775 780  
Ser Gln Ile Leu Pro Asp Pro Leu Lys Pro Thr Lys Arg Ser Phe Ile  
785 790 795 800  
Glu Asp Leu Leu Phe Asn Lys Val Thr Leu Ala Asp Ala Gly Phe Met  
805 810 815  
Lys Gln Tyr Gly Glu Cys Leu Gly Asp Ile Asn Ala Arg Asp Leu Ile  
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Cys Ala Gln Lys Phe Asn Gly Leu Thr Val Leu Pro Pro Leu Leu Thr  
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Val Leu Tyr Glu Asn Gln Lys Gln Ile Ala Asn Gln Phe Asn Lys Ala  
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Ile Ser Gln Ile Gln Glu Ser Leu Thr Thr Thr Ser Thr Ala Leu Gly  
915 920 925  
Lys Leu Gln Asp Val Val Asn Gln Asn Ala Gln Ala Leu Asn Thr Leu  
930 935 940  
Val Lys Gln Leu Ser Ser Asn Phe Gly Ala Ile Ser Ser Val Leu Asn  
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Asp Ile Leu Ser Arg Leu Asp Lys Val Glu Ala Glu Val Gln Ile Asp  
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 Gly Val Val Phe Leu His Val Thr Tyr Val Pro Ser Gln Glu Arg Asn  
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 Arg Glu Gly Val Phe Val Phe Asn Gly Thr Ser Trp Phe Ile Thr Gln  
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 Arg Asn Phe Phe Ser Pro Gln Ile Ile Thr Thr Asp Asn Thr Phe Val  
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 Ser Gly Asn Cys Asp Val Val Ile Gly Ile Ile Asn Asn Thr Val Tyr  
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 Tyr Phe Lys Asn His Thr Ser Pro Asp Val Asp Phe Gly Asp Ile Ser  
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 Asn Glu Val Ala Lys Asn Leu Asn Glu Ser Leu Ile Asp Leu Gln Glu  
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 Leu Gly Lys Tyr Glu Gln Tyr Ile Lys Trp Pro Trp Tyr Val Trp Leu  
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